ANALYSIS OF ACTIVITIES IN PRODUCTION TYPEWRITING AND

DEVELOPMENT OF A TEACHING MODEL AND STANDARDS

DISSERTATION

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By

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The problem of this study is an analysis of activities

in production typewriting, development of a teaching model,

and establishment of production standards. The study has

four main purposes which are: (1) to identify the time

spent in keystroking, decision making, typing from longhand

copy, erasing an original, typing and correcting one carbon

copy, and proofreading; (2) to test the correlation between

anxiety level and decision-making time, self concept and

decision-making time, and IQ and decision-making time; (3)

to analyze the differences in difficulty level of six pro-

duction tasks and develop a teaching model; and (4) to discover

the mean gross words per minute rate and total number of er-

rors on six production tasks and develop production standards.

The study was composed of 234 students; 153 students

were in the second semester of high school typewriting; 66

students were in the fourth semester of high school type-

writing; 15 students were in a community college class and

had more than four semesters of typewriting.

In order to satisfy the purposes of this study, students

were tested on six types of copy (letters, tables, rough-draft

reports, memorandums, manuscripts, and invoices, under five
work conditions which ranged from arranged typewritten copy
with no erasing to unarranged longhand copy with erasing,
making a carbon, and proofreading. The statistical procedures
employed included three-way analyses of variance, two-way
analyses of variance, one-way analyses of variance, and
Pearson product-moment correlations.

It was found that the second-semester student spent the
following percentages of time in production activities: key-
stroking, 48.00 per cent; decision making, 8.79 per cent;
typing longhand, 8.01 per cent; erasing an original, 11.48 per
cent; and making a carbon, erasing, and proofreading, 23.72
per cent. The fourth-semester student spent the following
percentages of time in production activities: keystroking,
53.37 per cent; decision making, 9.08 per cent; typing longhand,
11.64 per cent; erasing an original, 10.26 per cent; and making
a carbon, erasing, and proofreading, 15.65 per cent. The stu-
dent with more than four semesters spent the following percentages
of time in production activities: keystroking, 50.09 per cent;
decision making, 24.10 per cent; typing longhand, 3.66 per cent;
erasing an original, 9.02 per cent; and making a carbon, erasing,
and proofreading, 13.13 per cent. A correlation was found be-
tween decision-making time and IQ, but no correlation was found
between decision-making time and anxiety or self concept. The
order of difficulty of the six production tasks (from least
difficult to most difficult) was: memorandum, report, letter,

manuscript, invoice, and table. Speed standards and accuracy standards were set for the six production tasks for the three levels of instruction.

The major conclusions of this study are: (1) keystroking time increases as the instructional level increases; (2) decision-making speed does not increase as the instructional level increases; (3) decision-making errors do not decrease as the instructional level increases; (4) time spent typing longhand copy does not decrease as the instructional level increases; (5) the student does not increase in proofreading ability as the instructional level increases; (6) the higher the IQ of the student the faster the student makes decisions; (7) students make fewer errors on harder copy; (8) production tasks should be taught in the following order: memorandums, reports, letters, manuscripts, invoices, and tables.

It is recommended that more instructional time be spent in teaching decision making, proofreading, numeric copy, tabulation copy, and longhand copy.

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CHAPTER I

INTRODUCTION

The objective of all typewriting instruction is to teach
the student a skill in the real-life tasks of vocational and
personal typewriting. However, the preponderance of material
in typewriting has dealt with the factors involved in teach-
ing the keyboard and developing speed and accuracy. Few
jobs exist in today's business world in which the typist is
merely a copyist; the typist must apply his skill to a pro-
duction situation. Although basic keystroking skill is
essential, the true test of a good typist is his ability to
apply his skill to the production of office or personal tasks.

In production typewriting, the student must transform
unfinished material into well-arranged, readable copy with
efficiency? How much time is spent on the various activities
of production typewriting? In what order should production
tasks be taught? What standards should be set for production
tasks? These questions are a few of the ones that need to be
answered concerning production typewriting.

Muhich, in 1967, did a study which dealt with an analysis
of the activities in the application of skill to typewriting
problems. Keystroking, decision making, and identifying and

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correcting errors were analyzed. Her study had the limitations of few students (eighteen students in the second semester of high school typewriting, twenty-three students in the fourth semester of high school typewriting, and nineteen advanced college typists) and few problems (a business letter, a tabulation problem, and a longhand draft).[1]

One of the findings of Muhich's study was that planning and decision making involve approximately 50 per cent of the total time of the student engaged in production typewriting. The loss of speed by students from straight-copy typewriting to production typewriting has long been recognized by typewriting instructors. Certainly, there is more to production typewriting than keystroking--decision making plays a vital role in production typewriting.

Of importance to the typewriting teacher also are the difficulty levels of various production tasks. Stolurow has stated that one way to speed the learning process in skill subjects is to minimize the variation in early learning materials.[2] If the typewriting instructor knows the difference in difficulty between various types of copy, then the student can progress gradually from one level of difficulty

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[1]Dolores Muhich, "Keystroking vs. Decision-Making Factors in Proficiency at Office-Typing Tasks," unpublished master's thesis, Graduate School, Southern Illinois University, Carbondale, Illinois, 1967, p. 44.

[2]Lawrence M. Stolurow, "The Psychology of Skills, Part II: Analysis and Implications," Delta Pi Epsilon Journal, II (March, 1959), 18.

to another. Another important area in production type-
writing concerns standards. Although some straight-copy
standards have been set based on research, production stan-
dards are lacking.

Since the ultimate aim of typewriting instruction is
for the student to be able to use his typing skill in pro-
ducing real-life tasks in vocational and personal type-
writing, the instructor needs a thorough understanding of
activities in production typewriting, the difficulty levels
of various production tasks, and a knowledge of realistic
speed and error standards.

Statement of the Problem

The problem of this study was an analysis of the activi-
ties in production typewriting, the development of a teaching
model for six production typewriting tasks, and the establish-
ment of production standards for three levels of instruction.

Purposes of the Study

The purposes of this study were: (1) to identify the
percentage of time spent in keystroking, decision making,
typing from longhand copy, erasing an original, typing and
correcting one carbon copy, and proofreading on six pro-
duction typewriting tasks; (2) to test the correlation between
anxiety level and decision-making time, self concept and
decision-making time, and IQ and decision-making time;
(3) to analyze the differences in difficulty level of six

production tasks and to develop a teaching model for these tasks; and (4) to discover the mean gross words per minute rate and total number of errors on six production tasks and to develop production standards for these tasks.

Questions were answered from the performance scores of typewriting students on six production tasks, at three levels of instruction, and under five work conditions. The six production tasks were: letter, table, manuscript, memorandum, rough-draft report, and invoice. The three levels of instruction were: second-semester high school, fourth-semester high school, and more than four semesters at the community college level. The five work conditions were:

Arranged typewritten copy without erasing

Unarranged typewritten copy without erasing

Unarranged longhand copy without erasing

Unarranged longhand copy with erasing

Unarranged longhand copy with erasing, typing and correcting one carbon copy, and proofreading

These questions form the sub-purposes of this study.

Sub-Purposes

1. What percentage of the production task for each activity is spent in keystroking?

2. What percentage of the production task for each activity is spent in decision making?

3. What percentage of the production task for each activity is spent in typing from longhand copy?

4. What percentage of the production task for each activity is spent in erasing an original?

5. What percentage of the production task for each activity is spent in typing and correcting one carbon copy and proofreading the copy?

6. What is the correlation between anxiety level and decision-making time, self concept and decision-making time, and IQ and decision-making time?

7. What are the differences, if any, in keystroking speed among letters, rough-draft reports, manuscripts, memorandums, tables, and invoices?

8. What are the differences, if any, in keystroking errors among letters, rough-draft reports, manuscripts, memorandums, tables, and invoices?

9. What are the differences, if any, in decision-making among letters, rough-draft reports, manuscripts, memorandums, tables, and invoices?

10. What are the differences, if any, in errors in decision making among letters, rough-draft reports, manu-scripts, memorandums, tables, and invoices?

11. What are the differences, if any, between keystroking speed on typewritten copy and longhand copy?

12. What are the differences, if any, between keystroking errors on typewritten copy and longhand copy?

13. What is the mean number of errors made on letters, rough-draft reports, manuscripts, memorandums, tables, and invoices?

14. What is the mean gross words per minute rate on letters, rough-draft reports, manuscripts, memorandums, tables, and invoices?

15. What standards should be set for the six production tasks at the three levels of instruction.

Background and Significance of the Study

The crucial test of the successful typewriting student is his ability to produce copy in well-arranged form in a minimum amount of time. This ability is known as production skill and is the primary objective of typewriting instruction. However, according to West, production proficiency is the weakest aspect of typewriting instruction. He states that the following concepts have dominated instruction in type-writing:

    a. Much attention throughout training to ordinary
       copy skills on the supposition that such skills
       contribute importantly to production proficiency;
    b. Relatively late introduction of realistic personal
       and vocational typing tasks;
    c. Much typing from prearranged materials and much
       teacher and textbook guidance, in advance of
       typing, on matters of placement of copy on the
       page (margins, tab stops, etc.)--even at
       relatively late stages of training;
    d. Confining of production tasks to the simpler
       ones.[3]

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[3]Leonard J. West, "Trends in Teaching Typewriting," Business Education Forum, XXVI (May, 1972), 22.

Studies have indicated that straight-copy skills alone do not insure success at production typewriting tasks. According to Busher, students type at different rates of speed on different types of copy.[4] Gemmell stressed the importance of the non-typing segments of production work.[5] Martin found that students who are intensively trained in straight copy do not transfer any more skill to problems than students with less intensive training.[6] Nelson determined the effect of the elimination of straight-copy timed writings upon the achievement of first-semester students. He suggested that typewriting instructors may exclude straight-copy timed writings without fear of harming their students' achievement in typewriting.[7] Crawford conducted a study in which the

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[4]Virginia Ann Busher, "Measuring the Achievement of First- and Second-Year Typewriting in Terms of Quantity of Work Produced," unpublished master's thesis, University of Southern California, 1942, cited in Charles H. Duncan, "Major Contributions to the Theory and Practice of Production Typewriting," Practices and Preferences in Teaching Typewriting, Monograph 117 (March, 1967), p. 67.

[5]James Gemmell, "An Analysis of Some Factors That Affect Speed in Typewriting Business Letters," unpublished master's thesis, New York State College for Teachers, 1943, cited in Duncan, p. 68.

[6]George Edward Martin, "The Effects of Continuous and Interval Speed-Forcing Methods in Learning to Typewrite," unpublished doctoral dissertation, University of Pittsburgh, 1954, cited in Duncan, p. 69.

[7]George Nelson, Jr., "The Effects of the Elimination of Timed Writings Upon the Achievement of Beginning Typewriting Students," Business Education Forum, October, 1970, p. 43.

control group spent two-thirds of instructional time on speed building and one-third on production typewriting; the experimental group devoted all instructional time to production typewriting. On a final performance test, the experimental group exceeded the control group as to performance rate.[8] West states, "The supposition that stroking skills play a substantial role in production proficiency is one of the major fallacies of traditional instruction."[9] However, stroking speed is the only factor in straight copy that contributes appreciably to production proficiency. A correlation in the .70s does exist between straight-copy speed and production speed.[10]

Since production ability is the primary objective of typewriting, how much time does the student spend on the various activities of production typewriting? Muhich has indicated that decision making takes up approximately 50 per cent of the student's time in production work.[11] A study by Webb indicates that one-fourth to one-third of the time in

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[8]Thomas James Crawford, Production Typewriting, Monograph 97 (Cincinnati, 1960), pp. 1-24.

[9]Leonard J. West, Implications of Research for Teaching Typewriting, Delta Pi Epsilon Research Bulletin No. 4 (St. Peter, 1974), p. 24.

[10]West, "Trends in Teaching Typewriting."

[11]Muhich, op. cit., p. 58.

production typewriting is devoted to planning the layout.[12]

If decision making does require this large a percentage of

the student's time, then what factors are involved in decision

making?

Studies done outside of business education have reported

factors that relate to problem-solving success.[13] Cartwright

and Festinger found that there is a relationship between

decision time and decision confidence.[14] Child and Whiting

found that the individual's confidence in his ability to

attain goals affects his estimate of his performance in a

given task.[15] A number of studies have reported a signifi-

cant relationship between an adequate self concept and

academic achievement.[16]

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[12]Ella May Webb, "A Time Study in Tabulation Type-
writing," unpublished master's thesis, School of Education,
The University of Tennessee, Knoxville, Tennessee, 1963,
pp. 25-32.

[13]Elizabeth G. French, "Effects of Interaction of
Achievement, Motivation, and Intelligence on Problem Solving
Success," American Psychologist, XII (September, 1957),
399-400.

[14]D. Cartwright and L. A. Festinger, "A Quantitative
Theory of Decision," Psychological Review, L (1943), 595-
621, cited in Jack Block and Paul Petersen, "Some Per-
sonality Correlates of Confidence, Caution, and Speed in a
Decision Situation," The Journal of Abnormal and Social
Psychology, LI (July, 1955), 35-40.

[15]Irvin L. Child and John W. M. Whiting, "Determinants
of Level of Aspiration: Evidence from Everyday Life," The
Study of Personality, edited by Howard Brand (New York,
1954), p. 505.

[16]William W. Purkey, Self Concept and School Achievement
(Englewood Cliffs, 1970), pp. 15-17.

Anxiety has been investigated in relation to learning. Stolurow has this to say in regard to anxiety and skill subjects:

> Moderate amounts of tension promote learning, but excessive amounts may interfere with making the required responses to the task. If the task is simple relative to the ability of the learner, an anxious learner will perform better than a non-anxious one. However, if the task's complexity or difficulty exceed the learner's capacity, non-anxious persons will do better.[17]

This statement is consistent with the findings of a study done by Shephard and Abbey which showed that high anxiety subjects learned better when the task difficulty was low and low anxiety subjects learned better when the task difficulty was high.[18]

In an attempt to determine what factors are involved in decision making in production typewriting, self concept, anxiety, and intelligence were correlated with time involved in decision making. If the typewriting teacher is to help the student in making faster decisions, then the teacher must be aware of the factors involved in making decisions.

According to the NOBELS study, handwritten rough drafts were the source of copy reported by 66 per cent of the typists.[19]

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[17]Stolurow, op. cit., p. 22.

[18]A. H. Shephard and D. S. Abbey, "Manifest Anxiety and Performance on a Complex Perceptual Motor Task," Perceptual and Motor Skills, VIII (November, 1958), 327-330.

[19]Lawrence W. Erickson, Basic Components of Office Work-- An Analysis of 300 Office Jobs, Monograph 123 (Cincinnati, 1971), p.10.

Yet, little longhand copy is used in typewriting instruction. Is there a difference in the speed and accuracy the student attains from typewritten copy to longhand copy? If there is a significant difference in speed and accuracy, the typewriting teacher should be knowledgeable of this difference. One of the purposes of this study was to determine if a difference does exist.

In what order should production tasks be taught? If psychological skill principles are to be carried out, then there should be a gradual progression from the easy to the difficult tasks. Stolurow states that when a student is introduced to a new skill task, his response may be withdrawal or anticipation--approach or avoidance of the task. Conflict may precede the actual experience of a new task or conflict may occur at the first failure or after a few failures. Because of this approach-avoidance syndrome, early success is important.[20] Early production success in typewriting contributes to the continued success of the student. One of the purposes of this study was to set up a model for teaching the six production tasks based on the difficulty of the tasks.

No production typewriting standards exist at the present time. Even though ordinary copying skill makes only a slight contribution to proficiency in production typewriting, much work has been done on standards in straight copy. From speed

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[20]Stolurow, op. cit., pp. 16-30.

and error figures in a study by Robinson,[21] West has pre-
pared gross words per minute speed charts for the first and
second semester of typewriting. West suggests that teachers
should begin to accumulate data on student performance on
production tasks under unarranged copy conditions so that
standards can be formulated for production typewriting.[22]
One of the purposes of this study was to discover the mean
speed on letters, tables, rough-draft reports, manuscripts,
memorandums, and invoices under realistic work conditions.

This study has significance to the instructor of pro-
duction typewriting in four main areas. First, the percentage
of time spent in keystroking, decision making, typing from
longhand copy, erasing an original, and typing a carbon,
correcting the carbon copy, and proofreading on six production
tasks was identified. Therefore, the instructor can define
the areas which require more concentrated instruction time.
Second, the correlation between anxiety level and decision-
making time, self concept and decision-making time, and IQ
and decision-making time was tested. This provides the
instructor with some knowledge of the factors involved in
decision making. Third, by analyzing the differences in
difficulty levels between six production tasks, this study

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[21]J. W. Robinson, "Effects of Copy Difficulty Upon
Typewriting Performance," unpublished doctoral dissertation,
University of California, Los Angeles, California, 1966.

[22]Leonard J. West, The Acquisition of Typewriting Skills
(New York, 1969), pp. 552-576.

provides a model for the teaching order of these tasks.
Fourth, with a knowledge of the mean speed and errors on
production tasks, standards were established.

Definition of Terms

Terms which have special meanings in this study are
defined as follows:

1. Arranged copy refers to items to be used in pro-
duction work which are displayed in the exact form in which
they are to be typed. Margins and all other machine settings
are indicated.

2. Unarranged copy refers to items to be used in pro-
duction work which are not displayed in the form in which they
are to be typed. All placement decisions must be made by the
typist.

3. Production typewriting is the typing of realistic
tasks.

4. Gross words per minute is the total number of words
typed per minute with no penalty for errors.

5. Keystroking errors are mistakes made in the actual
striking of an incorrect typewriter key.

6. Decision-making errors are mistakes made in placement
of the copy.

7. Rough draft is copy in which corrections and deletions
have been indicated.

8. Tables are alphabetic and numeric exercises placed
in columnar form.

9. __Modified__ __block__ __letter__ __style__ with blocked paragraphs is a letter style in which the date and closing lines start at center with all other lines against the left margin.

10. __Open__ __style__ __table__ is a style in which the column heads are underscored and centered over the columns. No other lines are used in the table.

Limitations

1. This study was limited to four high schools located in a metropolitan complex of approximately two million people. There were approximately two thousand students enrolled in each high school. This limitation was imposed because of the impossibility of securing the cooperation of a random sample of high schools. There is no reason to believe that students in high schools in other parts of the country differ in significant ways from the students that were included in this study.

2. This study was also limited to one night class on the community college level. The community college is located in a metropolitan area and had an enrollment of approximately six thousand students. This limitation was imposed due to the impossibility of finding an adequate number of full-time day community college students who had more than four semesters of typewriting instruction. The class consisted of people with quite different backgrounds. Some of the students were returning to school after being out for a number of years.

Most of the students were employed in offices during the day. Their years of office experience ranged from one to ten years. The age range was from nineteen to thirty-eight years. Due to these differences, the class is considered atypical compared with the regular full-time day community college typewriting class.

Basic Assumptions

1. It is assumed that the subjects responded honestly to the instruments used to measure self concept and anxiety.

2. It is assumed that the use of five schools and six teachers negated the effect of any single teacher or teaching method on the increased production efficiency of the students.

Instruments

The Tennessee Self Concept Scale was used to measure the self concept of the students. The Seventh Mental Measurements Yearbook lists 118 studies which have used the Tennessee Self Concept Scale. Retest reliability is in the high .80s. No information was given on the internal consistency of the scale.[23]

The Otis-Lennon Mental Ability Test was used for verbal intelligence. Reliability measures for beyond grade four are above .90. Validity is organized in accordance with the

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[23]Oscar Krisen Buros, editor, The Seventh Mental Measurements Yearbook, I (Highland Park, 1972), p. 364.

1966 <u>Standards</u> <u>for</u> <u>Educational</u> <u>and</u> <u>Psychological</u> <u>Tests</u> <u>and</u>

<u>Psychological</u> <u>Tests</u> <u>and</u> <u>Manuals</u> on content, criterion-

related, and construct categories. The test correlates

adequately with educational criteria and with other measures

of general scholastic aptitude.[24]

The IPAT Anxiety Scale was used to measure anxiety level.

The <u>Sixth</u> <u>Mental</u> <u>Measurements</u> <u>Yearbook</u> lists twenty-three

studies which have used this scale. The reliability coeffi-

cients range from .80 to .93 depending on the nature and type

of group. Construct validity ranges from .85 to .90.[25]

According to a review by Cohen:

> The IPAT Anxiety Scale's impressive systematic
> research background commends it for use as an
> overall measure. No competing test can compete
> in this crucial regard. For a quick measure of
> anxiety level in literate adolescents and adults
> for screening purposes, it has no peer.[26]

Design of the Study

This study was not a true experimental design in that a

pretest-posttest, control group design did not exist. No

treatment was applied to an experimental group with a com-

parison being made to a control group. Instead, students

at three levels of typewriting instruction were tested on

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[24]<u>Ibid.</u>, pp. 690-691.

[25]Oscar Krisen Buros, editor, <u>The</u> <u>Sixth</u> <u>Mental</u> <u>Measure-</u>
<u>ments</u> <u>Yearbook</u>, I (Highland Park, 1965), pp. 255-256.

[26]<u>Ibid.</u>, p. 256.

their skill in typing six office tasks under five work conditions in order to discover if differences in difficulty existed on these tasks. Also, the different activities involved in production typewriting were identified. Thus, the study was a discovery-identification process. Because the basic purposes had to do with discovery and identification, it was felt that sub-purposes stated in interrogative form were more appropriate to the design than the stating of hypotheses.

Procedures for Collection of Data

Sample

Permission was obtained from teachers at Irving High School, Irving, Texas; MacAruthur High School, Irving, Texas; Nimitz High School, Irving, Texas; Richardson High School, Richardson, Texas; and Mountain View College, Dallas Texas to use the performance scores of students in the typewriting classes.

It was decided that a sample size of 265 was needed based on the following formula:

$$N = (z/e)^2 (p) (1-p)$$

z = standard score corresponding to a given confidence level

e = amount of tolerable sample error

p = proportion of cases in population[27]

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[27]Gilbert Sax, Empirical Foundations of Educational Research (Englewood Cliffs, 1968), p. 144.

A 95 per cent confidence level with 5 per cent of error was used with the formula. There were 174,343 typewriting students in Texas during the 1974-75 school year. This number was 22 per cent of the total population in the high schools of Texas during 1974-75 (800,000 students).[28] Of this 22 per cent, 19 per cent of these students were in the first year of typewriting; and 3 per cent of these students were in the second year of typewriting. Based on these percentages, the following number and level of classes were used: (1) seven classes of second semester typewriting; (2) five classes of fourth semester typewriting; and (3) one class of more than four semesters of typewriting.

Time of Study

The Otis-Lennon Mental Ability Test, the Tennessee Self Concept Scale, and the IPAT Anxiety Scale were given the first of April.

The production typewriting portion of the study was conducted during the last part of April. Since two purposes of this study were to determine the mean number of errors and mean gross words per minute typed on production work, it was felt that the students should have reached almost maximum skill development for the semester. The last month of school was not chosen since it usually involves many extracurricular

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[28]Information received from Evelyn Kisner, Business Education Consultant for Texas Education Agency.

activities for seniors, and many of the students in the study were of senior classification.

Test Content

All students involved in the study produced the six office tasks under five work conditions. The six office tasks were: (1) letter, (2) table, (3) manuscript, (4) memorandum, (5) rough-draft report, and (6) invoice. The five work conditions were: (1) arranged typewritten copy without erasing, (2) unarranged typewritten copy without erasing, (3) unarranged longhand copy without erasing, (4) unarranged longhand copy with erasing an original, and (5) unarranged longhand copy with erasing, typing and correcting one carbon, and proofreading.

Five different letters, tables, manuscripts, memorandums, rough-draft reports, and invoices were used to offset practice effects that would have been present if the same copy was used under each of the different work conditions.

Copy Difficulty

The copy difficulty on the letters, rough-draft reports, manuscripts, and memorandums was average to high average. The copy was controlled according to the difficulty factors used in straight-copy--syllable intensity, average word length, and high frequency words. Robinson, by using 300,000 running words of communication in business which represented 2,039 pieces of writing and 1,012 writers, found that the

average syllable intensity was 1.5 and the average word length was 5.6 strokes per word. By using syllable intensity and average word length, he found that 75 per cent of the words used in the copy were high-frequency words.[29] Thus, average copy difficulty was used in this study; i.e., copy of approximately 1.5 syllable intensity, 5.6 average word length, and 75 per cent high freqency words.

At the present time, no copy is available for use in production typewriting that has been equated as to difficulty level. Straight-copy material is all that is available. Since it was felt copy difficulty must be controlled for the validity of the study, writing the copy used in this study was necessary.

The letters were modified block with blocked paragraphs. The letters did not contain any special features such as attention lines, subject lines, enclosure notations, or PS notations. The tables were open style with four columns-- one column consisting of alphabetic characters and three columns consisting of numeric characters. The manuscript copy was unbound format and contained two footnotes. The memorandums were typed on forms which contained guide words. The rough-draft reports contained proofreader's marks. The invoices were typed on printed forms and contained approximately 120 words to be filled in.

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[29]Jerry W. Robinson, "Matching Copy Structure to Practice Purpose in Typewriting," Practices and Preferences in Teaching Typewriting, Monograph 117 (March, 1967), pp. 53-58.

Test Administration

The classroom teacher administered all tests. An attempt was made to control the Hawthorne Effect by not informing the students that they were taking part in a study. Each activity was administered as a regular part of the classroom instruction.

The arranged copy was given the first six days with only one type of job per day given in order that the teacher could control the presetting of the copy. In second-semester classes, the remaining twenty-four jobs were typed the next twelve days with two jobs per day being typed. In order that the student be forced to change margin settings, the job order was: (1) invoice--rough draft report, (2) letter--table, (3) manuscript--memorandum. In fourth semester and beyond, the remaining twenty-four jobs were typed the next eight days with three jobs per day being typed. In order that the student be forced to change margin settings, the job order was: (1) letter--table--rough draft report, (2) memorandum--invoice--manuscript. In order to offset practice effects and day differences, the different work conditions and copy order were randomly selected.

The time was recorded to the nearest half minute on each typewriting task. Gross words per minute and gross errors were recorded for each task. Keystroking errors and decision-making errors were computed separately.

Procedures for Analysis of Data

Three-way analyses of variance were run on the three

levels of instruction, the five work conditions, and the

six types of copy to determine if there were significant

differences in: (1) keystroking speed, (2) keystroking errors,

and (3) decision-making errors. The data were further analyzed

through multiple comparison tests. The following figure depicts

graphically the three-way analysis of variance as it was used

in this study.
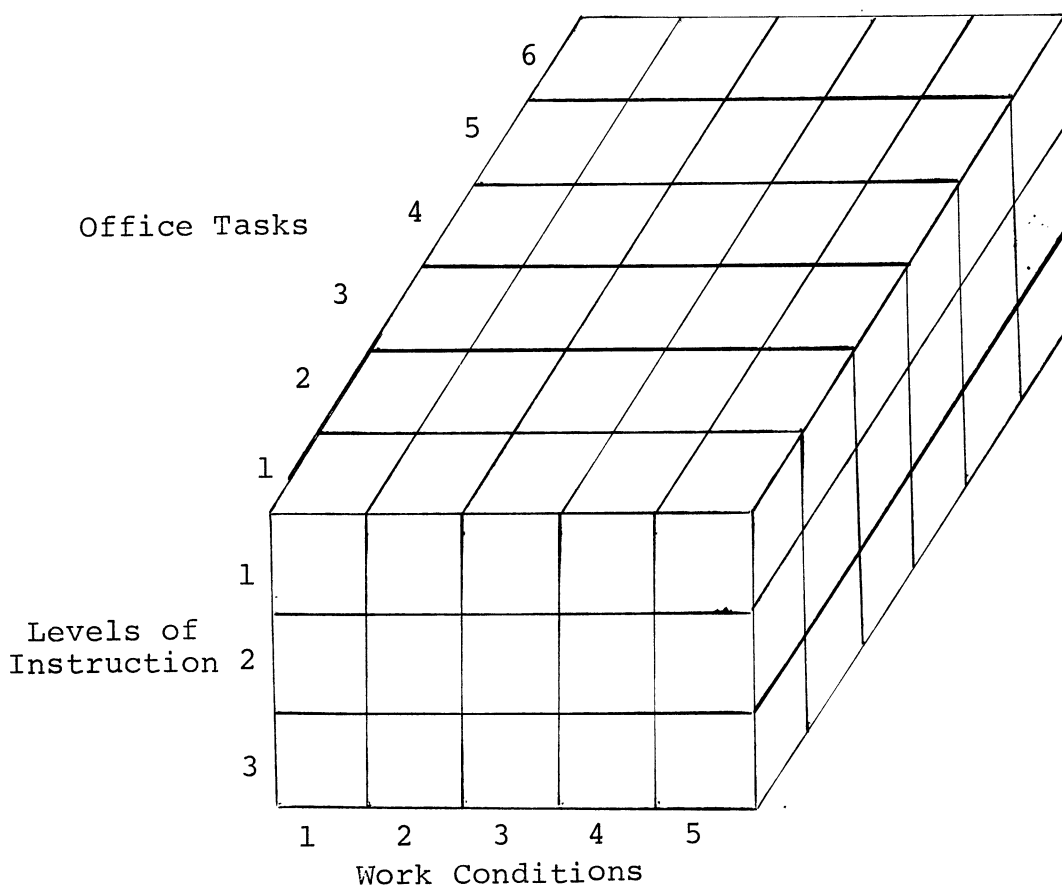
Fig. 1--Three-way analysis of variance model

Although analysis of variance is typically used with treatment groups in an experimental design, it was used here to discover differences in skill on particular office tasks.

One-way analyses of variance were run at each of the three levels of instruction to determine if there were significant differences in:(1) keystroking speed, (2) keystroking errors, (3) decision-making speed, and (4) decision-making errors.

Two-way analyses of variance were run at each of the three levels of instruction to determine if there were significant differences between: (1) keystroking speed on longhand copy and keystroking speed on typewritten copy and (2) keystroking errors on longhand copy and keystroking errors on typewritten copy.

Pearson product-moment correlations were run on: (1) decision-making speed and scores on the IPAT Anxiety Scale, (2) decision-making speed and scores on the Tennessee Self Concept Scale, and (3) decision-making speed and scores on the Otis-Lennon Mental Ability Test. The significance of these correlations was tested with the following formula:

$$t = r \sqrt{\frac{N - 2}{1 - r^2}}$$ [30]

[30]George A. Ferguson, Statistical Analysis in Psychology and Education (New York, 1971), p. 169.

Percentages of time involved in the production type-
writing activities were computed by taking the time involved
under each work condition. The mean number of errors and
the mean gross words per minute on letters, tables, rough-
draft reports, memorandums, invoices, and manuscripts were
computed.

CHAPTER II

RELATED LITERATURE

The production typewriting process, with an analysis

of its activities, is the focal point of this study. This

process did not receive much emphasis in the classroom until

approximately the last thirty years. In 1940, Blackstone

did a summary of the research in typewriting prior to that

date. Over 400 studies in the field of typewriting were

analyzed. The topical breakdown of these studies was:

status, objectives, prognosis, keyboard approach, teaching

devices, contests, and error studies. No studies were

mentioned that emphasized the production typewriting pro-

cess.[1] Typewriting was viewed mainly as a keystroking skill

with techniques and manipulation of machine parts seen as

important elements of the process. Rowe, in 1967, wrote that

approximately twenty years ago the emphasis was on developing

straight copy speed and accuracy.[2] In the last thirty years,

the authorities in typewriting, with the aid of research in

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[1]E. G. Blackstone, "Summary of Research in Typewriting,"
National Business Education Quarterly, VIII (March, 1940),
15-16, 42-45.

[2]John L. Rowe, "What Typewriting Research Has Accom-
plished," Business Education World, XLVIII (September, 1967),
12-14.

the field, have recognized that keystroking ability alone
does not insure success in the ultimate goal of typewriting
instruction; i.e., production typewriting skill. Research
has shown that keystroking skill does not automatically
transfer to production ability nor is the fast student in
keystroking necessarily the fast student in production type-
writing. Keystroking skill and production typewriting skill
are composed of some distinctively different elements which
require diverse teaching methodologies. A student may be
able to type at a high rate on straight copy yet not be able
to apply that skill to a problem situation. The main reason
for building a keystroking skill is for the student to be
able to apply that skill to a more complex situation.[3]

Crawford (1954) did a study of university intermediate
typewriting students to determine the effect of emphasizing
production typewriting contrasted with speed typewriting in
developing production typewriting ability. He found that the
greatest gains in production performance were achieved by
students taught by the production-emphasis method rather than
through the traditionally used straight-copy emphasis method.[4]
According to Crawford, the most difficult and most realistic
method of building production skill is one which requires the

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[3]Thomas James Crawford, "Toward A Broader Concept of
Problem-Production Typewriting," Practices and Preferences
in Teaching Typewriting, Monograph 117 (March, 1967), pp.
71-74.

[4]Crawford, Production Typewriting, pp. 1-24.

typist to handle a number of different jobs demanding compe-
tence in a variety of activities and forcing the typist to
demonstrate his capability of moving efficiently from one
type of job to another. This method of instruction is
realistic in relation to the business office challenges.[5]
If the student is to build a production typewriting skill,
the teacher must plan instruction so that there is a direct
transfer of learning to skill applications.[6] The student
needs to type problems without constant direction and super-
vision. Emphasis should be placed on all aspects of problem
typing--organizing materials, handling directions, adjusting
equipment, making computations, proofreading, erasing, and
correcting.[7]

This study is concerned with the activities of production
typewriting, the difficulty level of six different types of
copy (letters, tables, rough-draft reports, memorandums,
invoices, and manuscripts), the factors involved in decision
making, and the setting of standards. In reviewing the
related literature, the areas of concentration were: (1)
production typewriting activities, (2) psychological learning

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[5]Thomas James Crawford, "Developing Production Skill,"
Business Education Forum, XXIII (October, 1968), 15.

[6]Lawrence W. Erickson, "Changing Forces in Typewriting
Instruction . . . Prepare Today's Students for Tomorrow's
Needs," Business Education Forum, XXIII (November, 1968), 3-5.

[7]Daniel G. Hertz, "Are We Making Robots Out of Our Type-
writing Students?" Business Education Forum, XXVII (December,
1972), 26-27.

factors, (3) effect of IQ on typewriting ability, (4) production typewriting standards, and (5) copy difficulty.

Production Typewriting Activities

The production typewriting process involves keystroking, decision making and planning, erasing and correcting errors, and making carbon copies and proofreading. Although studies concerned with analyzing the percentage of time involved in the individual activities of production typing are not numerous, some work has been done in this area.

Time Spent in Individual Activities of Production Typing

Muhich (1963) did a study in which the major purpose was to assess the roles of keystroking skill and of decision-making ability in the typing of standard office tasks. Sixty subjects were used in the study of which eighteen students were in the second semester of high school typewriting, twenty-three students were in the fourth semester of high school typewriting, and nineteen students were in college typewriting. The nineteen college students had had more than four semesters of typewriting. Muhich used three types of copy (letters, tables, and rough drafts) that were equated as to difficulty by syllable intensity. The study showed that in typing letters, rough-draft copy, and tables, decision making consumed one-half of the time, keystroking consumed

three-eights of the time, and erasing consumed one-eighth of the time.[8]

Other studies have found keystroking time to consume a larger part of the production process. In 1969, Parsons analyzed the activities of second-semester high school students. The study revealed that the typewriter is used approximately 79 per cent of the time, with non-typing activities constituting approximately one-fifth of all class time. The three main non-typing activities were instructions given by the teacher, lost time, and proofreading.[9] Langer (1966) did a study composed of twenty students enrolled in the second year of high school typewriting. It was discovered that the typing activity was the major activity in the production process. The major non-typing activities were erasing and correcting errors with the organizing and handling of materials also a time-consuming factor. On the non-typing activities, slow typists took no more time to complete the activities than did fast typists.[10]

In 1943, Gemmell analyzed the activities involved in letter typewriting. He concluded from his study that the

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[8]Dolores Muhich, op. cit., pp. 42, 110.

[9]Karon May Parsons, "A Time-Analysis Study of Beginning Typewriting Classes in Selected High Schools," Business Education Forum, October, 1970, pp. 63-64.

[10]Pauline M. Langer, "A Study of the Production Typing Process," National Business Education Quarterly, XXXVI (October, 1967), 44.

transfer of straight-copy skill to production typewriting does not automatically occur and that students must be drilled on the non-typing segments of production typewriting.[11] Although Crawford's study in 1955 was not concerned with analyzing the activities in production typewriting, one of the implications seen from the study was that the non-stroking activities involved in production typewriting reflect the need for intensive instruction in non-typing areas.[12]

A study done by Webb (1963) was concerned exclusively with the activities involved in setting up and typing tabulation problems. Webb found that the greatest percentage of time for typing tables was spent on keystroking and tabulating in the table bodies. Non-keystroking activities consumed approximately one-third of the total time in typing tabulation problems. Erasing and correcting errors accounted for 16.10 per cent of the total time.[13]

A study done in the shorthand area by Jester (1963) identified and analyzed the activities in the shorthand transcription process. Thirty-six students were involved in this

[11]James Gemmell, "Why Does the Student Fail to Maintain His Straight Copy Rate When Typing Business Letters?" The Balance Sheet, December, 1944, p. 126.

[12]Crawford, Production Typewriting, pp. 1-24.

[13]Ella Maye Webb, "A Time Study in Tabulation Type-writing," unpublished master's thesis, School of Education, The University of Tennessee, Knoxville, Tennessee, 1963, pp. 25-32.

study. These students were timed on each activity in the
shorthand transcription process. Jester discovered that
61.9 per cent of the time in the transcription process was
devoted to typing activities. The top ten non-typing
activities with the percentage of time devoted to each are
in Table I.

TABLE I

NON-TYPING ACTIVITIES IN SHORTHAND TRANSCRIPTION

Rank	Activity	Percent of Time
1	Erasing and correcting	16.8
2	Proofreading and correcting	7.5
3	Deciphering incorrect shorthand outlines	6.2
4	Reading shorthand notes for context and meaning	5.1
5	Making ready	3.9
6	Dealing with spelling problems	3.8
7	Deciphering poor shorthand penman-ship	3.3
8	Supplying and verifying inside addresses	3.0
9	Supplying miscellaneous fill-in information	2.5
10	Dealing with tabulation problems	1.7

Jester concluded that the slowness of the student in
making decisions contributed much to the slowness of the
student in transcription.[14]

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[14]Donald D. Jester, The Shorthand Transcription Process
and Its Teaching Implications, Monograph 108 (Cincinnati,
1963), pp. 1-39.

Materials in Production Typewriting

In order that production typewriting training be the most beneficial to the student, the materials used in the process should resemble those actually typed in business offices. According to West, one of the rules of production training is to match the training conditions and the job conditions. Artificialities should be extracted from the training process, and the practice should be a duplicate of the job to the smallest detail.[15]

Several studies have been concerned with discovering what types of materials are used in business offices. In 1953, Frisch collected papers that were typed by clerical workers in New York. It was discovered from this study that 72 per cent of the material in typewriting textbooks was straight copy while the average clerk typist only has 14 per cent straight-copy work.[16] Wise (1968) compared materials obtained from business offices in Denver with production materials contained in the second-semester portion of selected typewriting textbooks. Significant differences were found between the materials received from business and

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[15]West, Acquisition of Typewriting Skills, p. 409.

[16]Vern Allen Frisch, "An Analysis of Clerical Business Typing Papers and Forms for the Improvement of Instructional Materials," unpublished doctoral dissertation, New York University, New York, New York, 1953, cited in Duncan, op. cit., p. 68.

the materials in the typewriting textbooks. From the analysis,
Wise concluded that in order to reflect the materials in
business offices, the material in typewriting texts should
be increased as to number copy, tabulation problems, and
memorandums. Manuscript and letter copy should be decreased.[17]

In a study done with 300 office workers in the Los
Angeles-Long Beach area, Erickson discovered that handwritten
rough drafts of correspondence, reports, and forms were the
main source of copy of 66 per cent of office workers.[18]
Frisch found that 34 per cent of office materials were hand-
written.[19]

Proofreading

One major aspect of the production typewriting process
is proofreading. Authorities in typewriting have recognized
the importance of proofreading and have stressed the fact
that it is a skill that must be taught. Anderson, Douglas,

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[17]Elva L. Wise, "A Comparative Study of the Materials
Typed by Beginning Typists in Representative Business Offices
of Metro Denver, Colorado, with Production Materials Con-
tained in Selected High School Typing Textbooks including
the Development of a Scale of Difficulty for Typing Similarly
Constructed Materials in Different Forms," unpublished doc-
toral dissertation, University of Colorado, Boulder, Colorado,
1968, pp. 75-85.

[18]Erickson, Basic Components of Office Work, p. 10.

[19]Vern Allen Frisch, "An Analysis of Clerical Business
Typing Papers and Forms for the Improvement of Instructional
Materials," unpublished doctoral dissertation, New York
University, New York, New York, 1953, cited in West, Acquisition
of Typewriting Skills, p. 564.

and Blanford suggest that the student should be taught to look for typographical, content, and technical errors.[20] In order to find out more about the proofreading process, some studies have been confined to this one area of production typewriting.

In 1965, Staples did a study to identify the abilities which an individual must possess to enable him to detect errors. It was discovered that interest factors, mental ability, and spelling are correlated with proofreading ability. An inverse relationship exists between speed of reading and proofreading proficiency--the faster proofreader is less likely to discover inaccuracies.[21] However, a study done by Wong (1974) indicated that a student could know the correct spelling of a word and not detect an error in the word while proofreading. The findings of the study showed that the students involved proofread at a 93.5 per cent accuracy level, yet their ability to spell the incorrectly typewritten words was 98.98 per cent. Wong concluded from this study that the assumption that inferior spelling ability is a major cause of poor proofreading should be questioned.

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[20]Ruth I. Anderson, Lloyd V. Douglas, and James T. Blanford, Teaching Business Subjects (New Jersey, 1965), pp. 158-160.

[21]John D. Staples, "An Experimental Study to Identify the Basic Abilities Needed to Detect Typescript Errors with Implications for the Improvement of Instruction in Typewriting," unpublished master's thesis, University of North Dakota, Grand Forks, North Dakota, 1965, pp. 45-50.

Wong believes that students do not proofread well due to habits that have been formed in reading. The student has been taught to read in word groups; and even if the student is instructed to proofread on a letter-by-letter basis, he unconsciously reverts to the word-group reading habit.[22]

Error Correction

Another important aspect of the production typewriting process is error correction. Authorities have also recognized the importance of this process and emphasized the fact that an erasing skill must be taught. According to Anderson, Douglas, and Blanford, erasing skill cannot be left to chance. The student must be drilled in the art of erasing.[23]

Studies concerned with errors in typewriting have analyzed what types of errors are considered serious to businessmen and business teachers, the average time spent in erasing, and the relationship of errors to reading skill. Fleser (1959) did a study to determine whether businessmen and business teachers follow the same practice in appraising the mailability of a letter. She discovered that the four errors that would cause a letter to be unmailable according to businessmen were: (1) letters in a word slightly out of line, (2) failure to space between words, (3) incorrect word

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[22]Shirley M. Wong, "Proofreading Pitfalls," Business Education Forum, May, 1975, pp. 16-17.

[23]Anderson, Douglas, and Blanford, op. cit., pp. 158-167.

division, and (4) presence of spaces within a word. Errors

considered minor by businessmen were: (1) uneven left

margin, (2) piling of letters, (3) inconspicuous strike-

over, and (4) too many spaces between words. Businessmen

were not as strict as the business teacher in judging

mailability.[24]

Triplett (1968) did a study to determine the relation-

ship of reading vocabulary and reading comprehension to

typewriting errors. It was discovered on straight-copy

timed writings that: (1) students with high reading

vocabulary made 77 per cent fewer errors than students with

low reading vocabulary, and (2) students with high reading

comprehension made 73 per cent fewer errors than students with

low reading comprehension. On production timings, students

with high reading vocabulary made 53 per cent fewer errors

than students with low reading vocabulary, and students with

high reading comprehension made 61 per cent fewer errors than

students with low reading comprehension.[25]

In the early 1950s Balsley did a study to determine the

average time the student typist spent in erasing. The study

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[24]Clare Honaker Fleser, "The Effect Upon Letter
Mailability of Ten Typewriting Errors as Judged by Business-
men and Business Teachers," unpublished master's thesis,
The Ohio State University, Columbus, Ohio, 1959, pp. 34-40.

[25]Betty Triplett, "The Relationship of Reading Vocabu-
lary and Reading Comprehension to Typewriting Errors in
Beginning Typewriting," National Business Education Quarterly,
October, 1969, pp. 48-49.

included students in high school and college. The findings are presented in Table II.[26]

TABLE II

TIME SPENT IN ERASING

Number	Course Level	Without Carbon	With Carbon
366	Second Semester High School	26 seconds	37 seconds
245	Fourth Semester High School	21 seconds	31 seconds
376	First Semester College	22 seconds	33 seconds
283	Second Quarter College	21 seconds	32 seconds
526	Second Semester College	19 seconds	28 seconds
181	Third Quarter College	19 seconds	29 seconds

Psychological Learning Factors

Certain psychological learning factors have been recognized as important in typewriting. The majority of methods books contain chapters on skill psychology and psychology applied to learning in typewriting. Book states that the psychological factors that contribute to learning to typewrite are: (1) the attitude of the learner toward the learning task, (2) the attitude of the learner toward success, and (3) belief of the learner that improvement is possible.[27]

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[26]Irol Whitmore Balsley, "A Study of the Validity of Some Methods of Measuring Straight-Copy Typing Skill," National Business Education Quarterly, XXVI (October, 1957), 9-10.

[27]William F. Book, Learning to Typewrite with Discussion of the Psychology and Pedagogy of Skill (New York, 1925), pp. 302-303.

If the student is to succeed, he must believe that success is possible. A belief in success comes from previous successes and is directly proportional to the previous successes.[28] At the opposite extreme, if the student continually experiences failure, learning in typewriting is impeded. According to Russon and Wanous, failure can cause these problems: (1) depression of the action potential, (2) slow responses, (3) move from reality, and (4) cumulative damaging feelings.[29]

Anxiety Level in Learning

The anxiety level of the student has been explored to a limited extent. Some authorities in typewriting have used learning theory principles to point out the fact that a certain amount of anxiety is necessary and desirable. West deals with anxiety as a motivator. He states that learning does not occur unless the learner is ready to react to stimuli and that through creating anxiety, attention is compelled. He sees a reasonable level of anxiety as being helpful to the learning situation. In fact, West cites the manipulation of anxiety as the most important motivational tactic. Through anxiety, dissatisfaction with the learner's present status is brought about, and then that dissatisfaction is removed by new learnings. The student is aware, or is made aware by

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[28]Ibid., p. 359.

[29]Allien R. Russon and S. J. Wanous, Philosophy and Psychology of Teaching Typewriting (Cincinnati, 1973), p. 101.

the teacher, of a dissatisfaction with his present knowledge.
Thus, anxiety is produced because of this dissatisfaction
with his present state. Anxiety operates as a plus factor
in the learning situation. However, West does note that both
extreme anxiety and the absence of any anxiety should be
avoided.[30] Erickson also sees anxiety as essential to skill
learning. Erickson feels that the student who is extremely
contented does not learn at capacity.[31]

Russon and Wanous stress the fact that a certain amount
of anxiety hastens learning in typewriting but that a high
level of anxiety can be extremely harmful to the typewriting
student. According to Russon and Wanous, the typewriting
student will encounter the law of diminishing returns in
anxiety. This law is particularly true when the task is a
complex one. Typewriting teachers are urged to recognize the
high anxiety student and take steps to help the student reduce
that anxiety in order that skill building may not be hampered.[32]

Dvorak, Merrick, Dealy, and Ford suggest that secondary
anxieties at the typewriter should be avoided. Secondary
anxieties are defined as anxieties that appear in the form of
worries and irrelevant recollections.[33]

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[30]West, Acquisition of Typewriting Skills, pp. 445-447.

[31]Lawrence W. Erickson, "Modes of Instruction and Their
Meaning," The Balance Sheet, XLVIII (March, 1967), 295.

[32]Russon and Wanous, op. cit., p. 100.

[33]August Dvorak, Nellie L. Merrick, William L. Dealey,
and Gertrude Catherine Ford, Typewriting Behavior (New York,
1936), p. 97.

Although the anxiety factor in learning is widely recog-
nized and accepted by typewriting authorities, few research
studies exist in this area. Freeman (1931) did a study with
seven students of beginning typewriting. He reported that the
beginning typist experiences a considerable amount of anxiety
as a new skill is learned, but this anxiety decreases as the
skill is mastered. According to his study, the anxiety level
of students dropped after several weeks of instruction on the
typewriter. Freeman concluded that a certain amount of anxiety
is necessary for a high level of performance on the typewriter
but that excess anxiety causes poor performance.[34]

Ehley (1970) did a study to determine the influence of
anxiety on speed and accuracy in first-semester high school
typewriting students. The Taylor Manifest Anxiety Scale was
administered during the second week of instruction. Students
were paired according to typewriting ability and anxiety
level. One of the findings of Ehley's study was that a high-
anxiety group in which students were paired according to
their typewriting speed attained higher straight-copy speed
than a high-anxiety group in which there was no special
seating arrangement. Practice in which speed was stressed
produced high anxiety states in the typists. Practice in
which high standards of accuracy were stressed produced high

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[34]G. L. Freeman, "The Facilitative and Inhibitory Effects
of Muscular Tension in Mental Work," Psychological Bulletin,
XXVIII (1931), 687-688, cited in Dvorak, Merrick, Dealey, and
Ford, op. cit., p. 88.

anxiety. Practice in which low standards were allowed pro-
duced low anxiety. Ehley concluded that moderate anxiety
is better than high or low anxiety. Both high and low anxiety
levels should be avoided.[35]

Some studies outside of business education have related
anxiety to psychomotor efficiency. The majority of these
studies have shown that high anxiety subjects learn better
than low anxiety subjects when the difficulty level of the
task is low. However, in more difficult learning tasks, low
anxiety subjects do better than high anxiety subjects.[36]
Taylor found that under non-stress conditions high anxiety
subjects were superior to low anxiety subjects in learning a
verbal task.[37] Shephard and Abbey (1958) did a study to
investigate the relationship between manifest anxiety and
performance on a complex perceptual-motor task. Two groups
of students at the university level were selected based on
their degree of anxiety. The subjects were rated on the
number of correct matches they made by moving rings and discs
in a motor task. The findings revealed that non-anxious sub-
jects performed at a higher level and made a lower percentage

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[35]Marvin Ehley, "The Influence of Manifest Anxiety on
Speed and Accuracy in First-Semester High School Typewriting,"
Business Education Forum, October, 1971, p. 33.

[36]Ernest S. Barratt, "Anxiety and Impulsiveness Related
to Psychomotor Efficiency," Perceptual and Motor Skills, IX
(October, 1959), 191.

[37]J. A. Taylor, "The Effects of Anxiety Level and
Psychological Stress on Verbal Learning," Journal of Abnormal
Social Psychology, LVII (1958), 55-60.

of errors than did anxious subjects.[38] This finding is consistent with related studies which have revealed that on a complex task low anxiety subjects perform better.

Effect of IQ on Typewriting Ability

Numerous studies have been done in an attempt to determine if IQ is related to the student's skill in typewriting. IQ has been correlated with straight-copy typewriting speed, straight-copy typewriting accuracy, production typewriting ability, and total achievement in typewriting. These studies have produced no absolute conclusions, but certain conclusions can be drawn with a limited degree of certainty.

<u>IQ</u> and <u>Typewriting</u> <u>Speed</u>

Although there are a few contradictory studies, the majority of studies indicate that there is little relationship between IQ and typewriting speed. Eckert (1960) compared intelligence and reading ability with a student's straight-copy typewriting ability. The correlation between IQ and straight-copy typewriting speed was .041.[39] Flanagan and Fivars (1964) reported a correlation of .28 between intelligence scores and straight-copy speeds.[40] Erickson (1964)

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[38]Shephard and Abbey, <u>op</u>. <u>cit</u>., pp. 327-330.

[39]Sidney W. Eckert, "A Comparison of Intelligence and Reading Ability with Speed and Accuracy in Typewriting," <u>National Business Education Quarterly</u>, XXIX (October, 1960), 17.

[40]J. C. Flanagan and G. Fivars, "The Tapping Test--A New Tool to Predict Aptitude for Typing," <u>Delta Pi Epsilon Journal</u>, March, 1964, pp. 33-39, cited in West, <u>Acquisition of Typewriting Skills</u>, p. 522.

found that typists with an IQ as low as 74 can learn to type at high speeds, but they need more time in learning to do so than does a person with a high IQ. Erickson pointed out that this corresponds with Bloom's contention that 90 per cent of all students can learn if they are given the necessary time to do so.[41] Robinson (1966) reported a correlation range of .347 to .406 between IQ and straight-copy speed.[42] Muhich (1967) found little relationship between general intelligence and straight-copy skill. Muhich concluded that too much emphasis is being placed on straight-copy typing since key-stroking is relatively easy to learn by students at all IQ levels.[43]

The one dissenting study in regard to straight-copy typewriting speed and IQ discovered in reviewing the literature for this study was done by Gregg in 1967. This study was conducted to determine whether IQ, reading scores, grade-point average, and motivation scores are related to students' straight-copy typewriting speed and error rate in beginning

[41]Lawrence W. Erickson, "The Teaching of Typewriting," Contributions of Research to Business Education, National Business Education Yearbook IX (Washington, 1971), p. 25.

[42]J. W. Robinson, "Effects of Copy Difficulty Upon Typewriting Performance," doctoral dissertation, University of California, Los Angeles, California, 1966, cited in Ibid., p. 19.

[43]Muhich, op. cit., p. 112.

typewriting. He found that the only significant predictor of straight-copy speed was the IQ score.[44]

IQ and Typewriting Accuracy

Research also indicates that there is no correlation between IQ and straight-copy accuracy. Robinson (1966) reported a correlation range of from -.043 to .042 between IQ and straight-copy accuracy.[45] Gregg (1967) found that there is no significant correlation between IQ and straight-copy error rate.[46]

IQ and Production Typewriting Ability

Several studies have been done investigating the correlation between IQ and production typewriting ability. Dake (1935) reported a correlation of .02 between intelligence and production typing proficiency.[47] Cook and Appel (1941) reported a correlation of .81 between intelligence and

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[44]James Gregg, "Relationship Between Straight-Copy Speed and Number of Errors in Typewriting and Other Cognitive and Motivational Variables," National Business Education Quarterly, XXVII (October, 1968), 18.

[45]Robinson, op. cit., p. 19.

[46]Gregg, op. cit., p. 18.

[47]L. G. Dake, "Testing in Typewriting," unpublished master's thesis, Harvard University, Cambridge, Massachusetts, 1935, cited in Muhich, op. cit., p. 24.

production typing proficiency.[48] In 1941, Kerl did a study

to determine the correlation between students' IQ and their

ability to plan and execute typewritten tabulated materials.

The correlation between IQ and tabulation production ability

for first year students was .6511 and .7115 for second year

students.[49] In 1967, Muhich found a .60 correlation between

decision-making tasks and IQ. Muhich concluded that as more

emphasis is placed on decision-making aspects, the relation-

ship between typewriting performance and IQ becomes increasingly

higher.[50] Hamed (1967) discovered a pronounced correlation

between production achievement and IQ.[51] McLean (1971) found

only trivial relationships between intelligence and office-

typing task proficiency; however, McLean's study was confined

mainly to low-ability students.[52]

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[48]W. W. Cook and M. Appel, "New Bases for Predicting Typing Success," Journal of Business Education, XVI (1941) 16-18, cited in Gary Neil McLean, "Difficulty Indices for Office-Typing Tasks," unpublished doctoral dissertation, School of Education, Columbia University, New York, New York, 1971, p. 15.

[49]Fay Grace Kerl, "A Study of the Relationship of I.Q. and Ability to Plan and Execute Typewritten Tabulation," unpublished master's thesis, School of Education, The University of Southern California, Los Angeles, California, 1941, p. 34.

[50]Muhich, op. cit., p. 113.

[51]Charles J. Hamed, "The Effectiveness of Spaced Practice and Massed Practice as Contrasted Methods of Developing Production Typewriting Ability," National Business Education Quarterly, Fall, 1968, p. 19.

[52]Gary Neil McLean, "Difficulty Indices for Office-Typing Tasks," unpublished doctoral dissertation, School of Education, Columbia University, New York, New York, 1971, p. 63.

Although the research writers are not in unanimous
agreement, the majority of studies do reveal a degree of
correlation between production typewriting ability and IQ.
There is relatively no correlation between straight-copy
speed and IQ where no decision-making factors are involved.
Yet, in production typewriting where decision-making factors
are a major part of the task, IQ appears to be positively
correlated with ability.

IQ and Total Typewriting Ability

Other studies have been done which compared total type-
writing ability and IQ. Davis (1924) correlated scores on
typewriting ability and IQ. He reported that IQ could not
predict success in typewriting.[53] Puckett (1930) found a
correlation between IQ and grades in typewriting and grades
in other subjects.[54] Stedman (1929) found the correlation
between IQ and achievement in typewriting to be very low.[55]
Miller (1929) found that the correlation between IQ and

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[53]H. H. Davis, "Measurement in Commerical Education in
the St. Louis Schools," University of Iowa Monographs in
Education, First Series, No. 7, cited in D. D. Lessenberry,
Methods of Teaching Typewriting (New York, 1937), p. 15.

[54]Cecil Puckett, "The Rank of the Inferior Student in
Typewriting," The Balance Sheet, cited in Ibid.

[55]Melissa Branson Stedman, "A Study of the Possibility
of Prognosis of School Success in Typewriting," Journal of
Applied Psychology, cited in Ibid.

standardized typewriting test scores was too low to justify

the use of intelligence tests alone in predicting success in

typewriting.[56] Ackerson (1926), George (1930), and Johnson

(1925) all agree that mentality does not seem to insure

typewriting ability.[57] O'Brien (1960) conducted a study to

determine if there were any traits, qualities, or abilities

that were characteristic of the highest and the lowest rank-

ing typewriting students. He discovered that the highest

ranking typewriting students were superior to the lowest

ranking typewriting students in intelligence.[58] Sorrell

(1958) discovered that very few students who were low in IQ

reached a high level of typewriting ability, and very few

students who were high in IQ were among the poorest typists.[59]

These studies indicate that there is not enough evidence

to justify using IQ as a predictor of overall success in

typewriting.

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[56]Alice Miller, "Relation of the I.Q. to Success in Learning Typewriting," Curriculum Study and Educational Research Bulletin, cited in Ibid.

[57]Luton Ackerson, "A Correlational Analysis of Proficiency in Typing," Archives of Psychology, Guy G. George, "The Prognostic Typewriting Tests Have Not Always Succeeded," Clara Louise Johnson, "The Validity of Certain Tests to Prognasticate Typewriting Ability," cited in Ibid.

[58]Edward J. O'Brien, "A Study of the Characteristics of the Highest and Lowest Ranking Typewriting Students," National Business Education Quarterly, XXIX (October, 1960), 39.

[59]Helen H. Sorrell, "A Study of Typewriting and Reading Scores," National Business Education Quarterly, October, 1959, p. 66.

Production Typewriting Standards

Need for Standards

Standards in production typewriting are essential in
evaluating the performance of the student. However, even
though the last thirty years has seen an increase in emphasis
in research in production typewriting, there are still no
widely accepted production standards. Typewriting authori-
ties have consistently pointed out the need for production
standards. Lamb (1947) stated that little has been done in
the area of quantity standards in typewriting, but quantity
must be measured.[60] Erickson (1952) reported that there are
no established standards of performance for production work.
However, he stated that setting usable standards and teaching
with them in mind would help to increase the production skill
of the student.[61] According to West (1969), there are no
reliable or acceptable standards in production typewriting.
He states, "From the days of the championship typists until
today straight copy skills have been the be-all and end-all
of proficiency measurement; for the production skills that
are the real objectives of instruction, there are no stan-
dards."[62]

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[60]Marion M. Lamb, Your First Year of Teaching Type-
writing (New York, 1957), pp. 72-74.

[61]Lawrence W. Erickson, "Some Problems of Teaching Type-
writing," A Guide for the Teaching of Typewriting, Bulletin
of the California State Department of Education, XXI
(Sacramento, 1952), p. 53.

[62]West, Implications for Teaching Typewriting, p. 30.

This statement does not imply that research has not been done in the area. There are numerous studies concerning production standards. However, there are several variables that must be considered in setting standards in production typewriting, and many of these studies have not been explicit in identifying how these important variables were handled. For example, according to Russon and Wanous, if production standards are to be meaningful, these data should be made available: (1) types of problems, (2) quality standards required, (3) number of carbons prepared, (4) time involved in setting the standard, and (5) type of copy--handwritten or rough-draft.[63] To these variables, West adds: (1) type of correction procedures (erasing, correct-a-type, or liquid paper) and (2) planning time involved.[64]

A few studies concerning existing standards have pointed to the lack of unanimity of opinion among business educators. DeHamer (1956) reviewed business education literature from 1954-1955 as to first-year typewriting standards. She found great variations in speed and accuracy requirements, and many business educators did not indicate whether speed standards were in gross, net, or correct words a minute. Also, some educators did not indicate the length of timings on which

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[63]Russon and Wanous, op. cit., p. 330.

[64]West, Acquisition of Skills, pp. 563-567.

their standards were based.[65] Giovanni (1966) did a study concerning the grading of production typewriting as revealed in the literature from 1955 through 1965. Giovanni found no agreement among authorities on the most effective way to grade production work.[66]

Straight-Copy Standards

Since straight-copy typewriting does not present the problem of many variables as does production typewriting, there is more agreement on standards among business educators. For example, in straight copy, no planning is involved, few decisions need to be made, no erasing is done, no carbon copies are made, and a standard time is widely accepted. Several studies have dealt with establishing standards for straight-copy testing. Balsley (1956),[67] DeHamer (1956),[68] and Robinson (1957)[69] did studies concerned with norms for straight copy. All of these studies contained a substantial number of students. Balsley's study had more than 1,000

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[65]Dorothy Jean DeHamer, "Speed and Accuracy Standards for First-Year Typewriting," National Business Education Quarterly, October, 1957, pp. 19-20.

[66]Mary Audrey Giovanni, "Conflicting Opinions in the Grading of Production Typewriting as Revealed in the Literature, 1955-1965," National Business Education Quarterly, XXXVI (October, 1967), 30.

[67]Balsley, op. cit., pp. 9-10.

[68]DeHamer, op. cit., pp. 19-20.

[69]James W. Robinson, "The Relation of Copy Difficulty to Typewriting Performance," Delta Pi Epsilon Journal, IX (1967), 9-24, cited in West, Acquisition of Skills, pp. 549-550.

students; DeHamer's study included scores on 700 to 1,600 students; and Robinson's study contained 2,500 first-semester students and 1,600 second-semester students. West used the data from these studies to set up speed and error charts for straight-copy timed writings for the first year of type-writing.[70]

Methods of Scoring Production Work

In addition to the number of variables in production work presenting a problem in setting standards, there has also been no widespread agreement among typewriting authorities as to methods of production scoring. Several years ago, budget systems were used with no timing on production work; the evaluation was on an error-per-job basis. Teachers have also given grades on production work based on a percentage of straight-copy rate. One of the problems here is that the tasks may vary in difficulty, and no allocation has been made for such variance. Another plan has been the use of mailability, but educators have trouble agreeing on the meaning of mail-ability.[71] Other grading plans that have been used are gross production rate a minute, net production rate a minute, mailable papers an hour, correct words a minute, and pro-duction words a minute. Net production rate a minute,

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[70]West, Acquisition of Skills, pp. 549-554.

[71]Fred E. Winger, "Typewriting," Changing Methods of Teaching Business Subjects, National Business Education Yearbook No. 10 (Washington, 1972), pp. 94-95.

mailable papers an hour, correct words a minute, and produc-
tion words a minute combine both speed and accuracy scores
into one score.

In the last few years, composite scores in production
typewriting have been questioned by the authorities in the
field. West reports that the use of composite scores in
production typewriting is objectionable--just as these scores
are objectionable in straight copy typewriting. No dis-
tinction is made between a fast, inaccurate typist and a
slow, accurate typist. Under composite scores, both typists
could receive the same grade which would indicate that they
are identical typists when in reality they are quite dif-
ferent. According to West, a separate score should be given
for both speed and quality.[72]

Some studies have pointed to the fact that a composite
score on straight-copy timings is not valid. Balsley (1956)
did a study of methods of measuring typing skill. The findings
of the study were: (1) both gross speed and accuracy must be
considered if measurement is to be valid; (2) gross speed and
accuracy improve independently of each other; the fastest
typists are not necessarily the most accurate; (3) the speed
of making corrections is greater with typewriting experience;
and (4) the setting of an error allowance on a time basis
makes it possible for a writing to be disqualified that

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[72]West, Implications for Teaching Typewriting, pp. 32-33.

actually has more strokes typed per error than others that qualify.[73] Muhich (1967) found that production words a minute scoring is not equal to gross words per minute scoring on straight-copy work. She concluded that production words per minute scoring contributes nothing and is not worth the extra effort.[74] West, after reviewing the research findings on the reliability and validity of various methods of scoring straight copy, concluded that the essentially zero relationship between straight copy speed and number of errors shows that the two aspects of performance are based on different factors.[75]

Production Standards in Relation to Straight Copy

Numerous studies have been done comparing scores on straight-copy timed writings with scores on production work. Rahe (1950) in reviewing the research in typewriting prior to 1949 reported studies done by Hammerand and Goldsmith on typewriting standards. Hammerand's study (1939) concerned determining the accomplishment of second and fourth semester typewriting students on straight copy and business letters. He found that the second semester students typed the straight-copy tests at a median rate of twenty-seven net words a minute

[73]Balsley, op. cit., pp. 9-10.

[74]Muhich, op. cit., p. 113.

[75]Leonard J. West, "Measurement and Development of Straight-Copy Typing Skill," Delta Pi Epsilon Journal, X (May, 1968), 25-30.

and business letters at a median of nineteen net words a minute. The fourth-semester students typed the straight copy at a median rate of thirty-nine net words a minute and the letters at a median of twenty-eight net words a minute.[76] Goldsmith (1944) found that straight-copy speed was approximately thirty-seven net words a minute and production typewriting speed was seven words a minute.[77]

Peterson (1952) found production gross speed rates average 17.9 while straight-copy speed rates average 35.3. He found production error rates averaged .17 and straight-copy error rates averaged .79.[78] Banner (1953) found net speeds on letters of first-year students ranged from 6.41 to 10.70 while net straight-copy speeds ranged from 18.76 to 24.52. Letter production tests were from 33.30 to 47.81

[76]W. L. Hammerand, "The Semestral Achievements of Typewriting Students in New Mexico High Schools," unpublished master's thesis, Colorado State College of Education, Greeley, Colorado, 1939, cited in Harves Christian Rahe, "Review of Research in Typewriting--A Classification and Summary of Studies Completed Prior to 1949," unpublished doctoral dissertation, School of Education, Indiana University, Columbus, Indiana, October, 1950, p. 350.

[77]Samuel Goldsmith, "Experiments in Typewriting," The Journal of Business Education, XIX (May, 1944), 21-22, cited in Ibid., p. 349.

[78]Charles Arthur Peterson, "A Study of the Relationship Between Straight-Copy Rates and Production Rates in College Typewriting," unpublished master's thesis, University of Tennessee, Knoxville, Tennessee, 1952, p. 65.

per cent of straight-copy rates.[79] Penar (1953) did a study
of the relationship between scores on straight copy and
scores on selected typewriting problems. He found that stu-
dents with the highest straight-copy scores transferred the
lowest percentage of skill to problem work; however, the net
result of these students was higher measured in words per
minute than that of the slower typists who transferred a
higher percentage of straight-copy speed to typewriting
problems.[80]

Jiles (1957) did a study to establish the relationship
between production rates and straight-copy rates of third
semester students. The median straight-copy rate found was
forty-six, and the median production rate found was ten.
There was almost a complete lack of correlation between
straight copy and production rates--.07.[81] Shubnell (1959)
in a study done with third-semester typewriting students
discovered the highest production achievement to be nineteen
words a minute with a median production rate of thirteen words

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[79]Mary Ruth Banner, "A Study of the Relationship Between
Letter-Production Test Rates and Straight-Copy Test Rates in
High School Typewriting (Virginia)," unpublished master's
thesis, The University of Tennessee, Knoxville, Tennessee,
1953, p. 55.

[80]Thaddeus H. Penar, "The Relationship Between Test Scores
on Straight-Copy Typewriting and Test Scores on Selected Type-
writing Problems," unpublished doctoral dissertation, School
of Education, University of Pittsburgh, Pittsburgh, Pennsylvania,
1953, pp. 78-80.

[81]Russell F. Jiles, "A Survey of Production Rates and
Production Quality of Third-Semester Typing Students," unpub-
lished master's thesis, University of Wisconsin, Madison,
Wisconsin, 1957, pp. 51-55.

a minute. The correlation between straight copy and production rate was .55. Students having the highest straight-copy skill did not transfer an equally high percentage of skill to production typewriting although these students had higher production rates than students with lower straight-copy rates. The median percentage of transfer from straight copy to production typewriting was 30 per cent, with the majority of the students transferring between 25 to 34 per cent of straight-copy rates to production typing.[82]

VonSchlick (1969) compared straight-copy scores and nine office-production problem scores. She discovered a significant negative correlation between test scores on percentage of transfer of speed and accuracy on straight-copy typewriting and speed and accuracy on office-production tasks.[83] Stuart (1943) found that a student's speed in typing letters was from two-thirds to three-fourths his straight-copy rate and in rough-draft typing from one-half to two-thirds his straight-copy rate.[84] Gemmell (1944) found that students

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[82]Sister May Lea Shubnell, "A Survey of Production Rates and Production Quality of Third-Semester Typing Students in Selected Catholic High Schools in Wisconsin," unpublished master's thesis, University of Wisconsin, Madison, Wisconsin, 1959, pp. 78-80.

[83]Ruth J. VonSchlick, "The Relationship Between Test Scores on Straight-Copy Typewriting and Simulated Office-Production Problems as Measured on Electric Typewriters," Business Education Forum, October, 1970, p. 51.

[84]Esta Ross Stuart, "Pattern Learning Speeds Up Mastery," National Business Education Quarterly, XII (December, 1943), 14.

produced letters at 73 per cent of their straight-copy rate.[85]
Clem reports that experimental studies have set up the relationships shown in Table III between net-copy rate and the typing of production tasks.[86]

TABLE III

RELATIONSHIP BETWEEN NET-COPY RATE
AND PRODUCTION TYPING

Type of Copy	Percent of Copying Speed
Simple rough drafts	40
Business letters	75
Envelopes	50
Stencils	50
Simple tabulated reports	25-40
Simple manuscripts	60-75
Manuscripts with footnotes	40-50

Tables IV and V show the findings of Robinson and Beaumont who in separate unpublished studies reported the skill transfer from straight copy to production typewriting for students in semesters one and four of typewriting.[87]

As is evident from the number of studies presented here, standards have been of concern to many research writers. Yet,

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[85]Gemmell, "Why Does the Student Fail to Maintain Straight Copy Rate?" p. 126.

[86]Jane E. Clem, Techniques of Teaching Typewriting (New York, 1955), p. 210.

[87]Jerry W. Robinson, editor, Strategies of Instruction in Typewriting (Cincinnati, 1972), pp. 42-43.

TABLE IV

PERCENT OF TRANSFER FROM STRAIGHT-COPY TYPEWRITING
TO PRODUCTION TYPEWRITING FOR SEMESTER ONE

Kind of Copy	Bottom 25 Per Cent	Middle 50 Per Cent	Top 25 Per Cent
Straight Copy	100	100	100
Statistical Copy	63-93	60-89	54-89
Rough-draft Copy	75-96	73-95	69-93
Script Copy	89-100	77-100	77-100

TABLE V

PERCENT OF TRANSFER FROM STRAIGHT-COPY TYPEWRITING
TO PRODUCTION TYPEWRITING FOR SEMESTER TWO

Kind of Copy	Bottom 25 Per Cent	Middle 50 Per Cent	Top 25 Per Cent
Straight Copy	100	100	100
Statistical Copy	74-88	72-91	70-82
Rough-draft Copy	84-91	79-93	80-90
Script Copy	86-100	94-100	95-100

from these studies presented, no meaningful standards can be set. Several problems are readily evident. Important variables such as levels of instruction, methods of scoring (net words per minute, gross words per minute, etc.), types of copy, difficulty level of copy, lengths of copy, error correction procedures, and carbon copies were either not considered or

not reported in many of the studies. Several of the studies
dealt with percentage of transfer from straight copy to pro-
duction work. However, the fallacy of this procedure was
pointed out from the findings of studies done by Penar[88] and
Von Schlick.[89] Both studies showed that the per cent of trans-
fer is not constant from one student to another and from one
level of instruction to another. In general, these two stu-
dies show that the faster straight-copy student transfers less
of his ability to production work while the slower straight-
copy student transfers a higher percentage of straight-copy
skill to production typewriting.

Difficulty Indices for Production Problems

Some work has been done in regard to setting up diffi-
culty levels for certain types of production copy. Wise (1968)
used copy gathered from business offices in Colorado and
equated the copy in terms of the percentage of unusual words,
numbers, and symbols used. A difficulty scale was then pre-
pared which is shown in Table VI.[90]

Wise discarded unmailable items in her study, and the
production tests were only ten minutes in length. By dis-
carding unmailable items, the true number of words the student

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[88]Penar, op. cit., pp. 78-80.

[89]Von Schlick, op. cit., p. 51.

[90]Wise, op. cit., pp. 75-85.

TABLE VI

DIFFICULTY LEVEL OF PRODUCTION COPY

Classification	Average Production Rate	Difficulty Factor
Straight-copy	32.45	1.00
Long letter	27.31	1.25
Multiple-page letter	26.27	1.25
Short manuscript	25.75	1.25
Medium letter	25.12	1.25
Long memorandum	23.61	1.40
Long manuscript	23.36	1.40
Short letter	20.56	1.65
Short memorandum	19.53	1.65
Two-column tabulation	8.52	4.50
Three-column tabulation	7.92	4.50
Four-column tabulation	7.16	4.50
Five-column tabulation	5.73	4.50
Six-column tablulation	5.34	6.30
Eight-column tabulation	4.98	6.30
Fourteen-column tabulation	3.95	8.25
Seven-column tabulation	3.91	8.25

typed on production work was considerably reduced. West states that discrimination is lost when items that are unmailable are discarded.[91] For example, two students may have one paper each discarded because it is unmailable. One student may have made ten errors in the copy discarded while the other student may have made only one error. To do so implies both students are equal in ability when in reality they are quite different.

[91]West, Acquisition of Skills, p. 579.

McLean (1971) developed equations for estimating the
difficulty of three major production tasks--letters, tables,
and manuscripts. An average of 121 students at each of three
levels of instruction (two, four, and four plus semesters of
typing training) were tested on each of sixty-four production
tasks (twenty-four letters, twenty-four tables, and sixteen
manuscripts from longhand copy). Production tasks were scored
for speed, number of form errors, and number of uncorrected
typographical errors. The students used were mainly of below-
average ability. The office tasks used had a stroke intensity
of 6.0 which was the same as the straight-copy timed writing
used in the study. From the data gathered in the study,
McLean constructed six tables (two each for letters, manu-
scripts, and tables) to be used in computing difficulty indices
of the three production tasks. McLean notes that the two
chief limitations of his study were the use of only two task
lengths (75 and 150 words) and indices based mostly on trainees
of below-average ability.[92]

Typewriting Skill Progression

McCoy (1959) did a study to determine the degree to which
typewriting skills are increased during the second year of
typewriting instruction. According to the study, the students
were approximately twice as proficient at the end of the second
year of instruction as they were at the beginning of the year.

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[92]McLean, op. cit., p. 63.

However, at the end of the second year, the straight-copy ability of 80 per cent of the students was below speed and accuracy standards for beginning employment. He reported that, although production standards are quite nebulous, it appeared that most students at the end of the second year did not possess production typewriting proficiency equivalent to employment standards for beginning typists.[93]

Garry (1967) did a study to determine whether there were significant changes in error patterns of typists during the second semester of typewriting. He concluded that students typed significantly faster during the second semester but not significantly more accurate. The total number of errors was stable from test period to test period. The rank order of error categories showed extreme stability indicating that the types of errors the students made from test to test were essentially the same.[94] Erickson (1964) also found that the error patterns remained somewhat constant. He found that errors ranged from 1.1 mean errors a minute on tabulation to 1.6 mean errors a minute on straight copy.[95]

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[93]Carl McCoy, "A Study of Achievement in Second-Year Typewriting," National Business Education Quarterly, XXIX (October, 1960), 47.

[94]John C. Garry, "An Analysis of Typescript Errors and a Determination of Developmental Patterns of Errors of First Year Typists on Electric Typewriters," unpublished doctoral dissertation, The University of North Dakota, Grand Forks, North Dakota, 1967, cited in Ray G. Price and Charles R. Hopkins, Review and Synthesis of Research in Business and Office Education (Columbus, 1970), pp. 51-52.

[95]Erickson, "Teaching of Typewriting," p. 24.

Copy Difficulty

Research has pointed to the fact that copy difficulty is
related to typewriting speed but not to typewriting accuracy.
Bell (1950) did a study to determine the effect of stroke
intensity, percentage of frequently-used words, and syllable
intensity on typewriting performance. Bell found that there
is an increase in the number of strokes when the percentage of
frequently used words is increased and a decrease in the number
of strokes when the percentage of frequently used words is
decreased. The greater the stroke intensity, the less the
number of gross strokes after 5.50 stroke intensity is reached.
Strokes decreased with an increase in syllable intensity.
Errors did not appear to be affeced by stroke intensity,
syllable intensity, and percentage of frequently-used words.[96]
Morris (1952) also found that high-frequency words had no
effect on errors made but did have a relationship to speed.
Morris reported a correlation of plus .68 between gross words
typed and high frequency words, minus .61 between gross strokes
typed and word length, and minus .47 between gross strokes
typed and syllable intensity.[97] Diehl (1972) did a study to

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[96]Mary LaVerne Bell, "Some Factors of Difficulty in
Typewriting Copy," unpublished doctoral dissertation, School
of Education, The University of Oklahoma, Norman, Oklahoma,
1950, pp. 56-60.

[97]Martha Jeraldine Morris, "The Relationship Between Per-
cent of Frequently-Used Words and Typewritability," unpublished
master's thesis, Virginia Polytechnic Institute, Blacksburg,
Virginia, 1952, cited in Robinson, "Matching Structure to
Practice Purpose in Typewriting," p. 55.

analyze the effects of variation in syllable intensity on straight-copy typewriting performance. Syllable intensities of 1.00, 1.20, 1.40, 1.70, 2.00, 2.50, and 3.00 were used. Three-minute straight-copy writings were given to 162 third-semester students grouped into high-speed, average-speed, and low-speed typists. Significant differences did exist in typewriting speed among the three levels of typists.[98]

Robinson, in an attempt to discover if any one of the difficulty factors used alone was a reliable index of copy difficulty, analyzed 305 paragraphs of typewriting copy and classified them as to difficulty level. For each paragraph, the three levels of copy difficulty were determined--stroke intensity, syllable intensity, and high frequency words. The writings were then categorized as to syllable intensity, stroke intensity, and percentage of high frequency words. He determined that controlling only one of the three variables does not insure that the other two factors of copy difficulty are controlled. All three factors must be controlled; the average level of difficulty on each factor is important. Robinson computerized Silverthorn's High-Frequency Business Vocabulary Word List and found that average syllable intensity was 1.5 and average stroke intensity was 5.6. Using 1.5 syllable intensity and 5.6 average word length, the number of high-frequency words

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[98]Joan Shaveland Diehl, "Effect of Extreme Variation of Syllabic Intensity Upon Straight-Copy Typewriting Performance," Business Education Forum, October, 1973, p. 39.

that could be expected in such copy was computed. It was found that the copy contained 70-80 per high-frequency words. Based on these findings, Robinson suggested the difficulty indices in Table VII.[99]

TABLE VII

COPY DIFFICULTY INDICES

	Easy	Low Average	Average	High Average	Difficult
Syllable Intensity	1.3	1.4	1.5	1.6	1.7
Average Word Length	5.2	5.4	5.6	5.8	6.0
High Frequency Words	85	80	75	70	65

In 1968, Perry identified the word combinations and the most frequently used words in current business correspondence. In doing so, a sample of business letters from all types of businesses was obtained. From this data, Perry discovered that: (1) 50 words account for over 45 per cent of all words written by business letter writers; (2) 100 words represent over one-half of the words used in business letters; and (3) 500 words account for almost three-fourths of all words used in business correspondence. Perry then compiled a

[99]Robinson, "Matching Structure to Practice Purpose in Typewriting," pp. 54-58.

list of the 500 most frequently used word combinations and
the 5,000 most frequently occurring words in business let-
ters.[100]

West considers high frequency words as the most
important index of difficulty level. According to West,
syllable and stroke intensity come from the fact that the
more common words tend to have fewer letters and syllables
than the less common words. West points out that the com-
monly used index of per cent of words is not at all the same.
Bell (1950) used 472 words as her common word list.[101]
Hillestad (1962) used 1,500 words as her common word list.[102]
West used the Silverthorn list in devising the percentages
that are given in Table VIII.

As can be seen from these percentages, 500 to 1,000
words account for approximately 70 to 80 per cent of the
words used in business correspondence. The size of the

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[100]Devern J. Perry, "An Analytical Comparison of the
Relative Word-Combination Frequencies of Selected Shorthand
Textbooks," unpublished doctoral dissertation, University of
North Dakota, Grand Forks, North Dakota, 1968.

[101]Mary LaVerne Bell, "Some Factors of Difficulty in
Typewriting Copy," unpublished doctoral dissertation, School
of Education, The University of Oklahoma, Norman, Oklahoma,
1950, cited in Leonard J. West, "The Vocabulary of Instruc-
tional Materials for Typing and Stenographic Training--
Research Findings and Implications," Delta Pi Epsilon Journal,
X (May, 1968), 13-25.

[102]Mildred C. Hillestad, "Factors that Contribute to
the Difficulty of Shorthand Dictation Materials," Delta Pi
Epsilon Journal, IV (August, 1962), 4, 2-18.

TABLE VIII

PERCENTAGE DISTRIBUTION OF THE VOCABULARY
OF WRITTEN BUSINESS COMMUNICATION

Number of Common Words	Per Cent of All Usage
5	16.8
10	24.8
25	37.3
50	45.0
100	53.1
200	61.0
500	72.4
1,000	81.4
2,000	89.5
2,500	91.7
5,000	96.9
11,055	100.0

common word list used is a crucial consideration when using one as an index for copy difficulty.[103]

Summary

Studies have shown that non-typing activities consume from one-fifth to one-half of the total time in production typewriting. The major non-typing activities are decision making, erasing and correcting of errors, and proofreading.

The material in textbooks has not been consistent with the type of material actually typed in business offices. To match office copy, straight-copy material, manuscript copy, and letter copy needs to be decreased. Tabulation copy, number copy, and memorandum copy needs to be increased. There also needs to be a greater percentage of handwritten copy.

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[103]Leonard J. West, "The Vocabulary of Instructional Materials for Typing and Stenographic Training--Research Findings and Implications," Delta Pi Epsilon Journal, X (May, 1968), 19.

One of the non-typing activities in production type-
writing is proofreading. Studies have been done to try to
discover the attributes of a good proofreader. One study
showed that spelling was correlated with proofreading
ability, while another study revealed that ability to spell
a particular word does not insure that an error in that same
word will be discovered while proofreading.

Another important non-typing activity is erasing. Errors
that would cause a piece of correspondence to be considered
unmailable by businessmen have been identified. Reading
ability, according to research, does have a relationship to
errors in typewriting. Students with high reading vocabulary
and comprehension make fewer errors on straight copy and pro-
duction typewriting than do students with low reading vocabu-
lary and comprehension. The average erasing time without
making a carbon copy ranged from twenty-six seconds for sec-
ond semester high school students to nineteen seconds for
second semester college students. The average erasing time
with a carbon copy ranged from thirty-seven seconds for
second semester high school students to twenty-eight seconds
for second semester college students.

Anxiety has been recognized as an important psycho-
logical factor in learning to typewrite. Only two studies
were discovered which dealt with anxiety in typewriting. A
moderate anxiety level appears to be more conducive to learning
in typewriting than either a high or low level of anxiety.

Studies done outside of business education reveal that high anxiety subjects learn better than low anxiety subjects when the difficulty level of the task is low. However, in more difficult learning situations, low anxiety subjects learn better.

There have been numerous studies done correlating IQ with typewriting ability. These studies have shown little or no relationship between IQ and straight-copy typewriting speed and accuracy. The majority of studies reveal a positive correlation between production typewriting ability and IQ. However, evidence does not support the use of IQ as a predictor of overall success in typewriting.

A number of studies have been done concerning production standards, but no significant progress has been made in setting widely accepted standards. Standards in production typewriting are much more difficult to set than straight-copy standards due to the number of variables that must be controlled; i.e., time involved, planning time, quality required, type of copy, type of problems, type of correction procedures, and number of carbons. Also, business educators have not been in agreement as to how production work should be scored; i.e., correct words a minute, net production rate a minute, gross production rate a minute, mailable papers an hour, or production words a minute. Several of the studies tied production work to straight-copy writings in a percentage score. Problems exist here in that the difficulty level of

all production work is not the same, and research has shown that the percentage of transfer of straight-copy to production work is not constant but is related to the student's ability and level of instruction.

Copy difficulty has been researched extensively. The three factors which in combination affect copy difficulty most are syllable intensity, average word length, and percentage of frequently used words. Copy difficulty does have an effect on typewriting speed but not on typewriting accuracy. Word lists have been compiled which contain the most frequently used words in business correspondence.

CHAPTER III

PROCEDURES

The procedural aspects of this study concern: (1) a
pilot study, (2) sample size, (3) composition of the sample,
(4) experimental design, (5) test content, (6) test order,
(7) control of variables, (8) test administration, (9) copy
difficulty, (10) test scoring, and (11) analysis of data.

Pilot Study

A pilot study was done with sixteen students enrolled
in intermediate typewriting at a community college. Of the
sixteen students, fourteen (88 per cent) were female and two
(12 per cent) were male. The main purposes in doing the
pilot study were to discover if any errors existed in the
timing procedures planned for the study, in the directions
for the teachers and students, or in the copy itself. Each
student was tested on three types of copy per class period.
A time score was recorded for each piece of copy that was
typed. Therefore, a time sheet was prepared with the students'
names typed in alphabetical order and with a space for the
time on each job to be recorded. A stop watch was started
at the beginning of the timing period and allowed to run for
the entire period. As a student finished a job, he raised his

hand; and his time was recorded to the nearest half-minute. He then immediately went on to the second job. In order to get the time involved for the second job, the time recorded for the first job was subtracted from the time recorded for the second job. For example, if the time recorded for job one was fifteen minutes and the time recorded for job two was thirty-one minutes, then the actual typing time for job two was sixteen minutes. This same procedure was followed in arriving at the actual typing time for job three. This plan of timing was successful in the pilot study; therefore, no changes were made.

Instruction sheets were given to the students each class period with the total instructions for that particular day. A portion of the jobs were totally arranged; therefore, the students were given complete instructions as to margins, tab settings, horizontal placement, and vertical placement. It was discovered in the pilot study that some of the instructions were not clear on the sheets involving totally arranged jobs. These instructions were then rewritten in preparation for the study. There were a total of fourteen instruction sheets used in the pilot study; five instruction sheets were rewritten.

One error was discovered in the copy. No errors were discovered in the teacher directions. No additional changes were made as a result of the pilot study.

Sample Size

The sample size needed, determined statistically, was 265. The formula used to arrive at this number was:

$$n = (z/e)^2 \ (p) \ (1-p)$$

z = standard score corresponding to a given confidence level

e = amount of tolerable sample error

p = proportion of cases in population[1]

A 95 per cent confidence level was used with the above formula.

A total of 330 students were involved in the study; but due to absences, there were usable scores from only 234 students. A loss of 20 per cent was anticipated; this amount of loss would still have allowed for the desired number in the study. However, due to the higher loss (29 per cent) which was not anticipated, the study was short of the determined number by 31.

Composition of the Sample

The sample composition is shown in Table IX.

In the second semester classes, there were 123 females (70 per cent) and 46 males (30 per cent). In the fourth semester classes, there were 64 females (97 per cent) and 2 males (3 per cent). In the more than four semester class, there were 13 females (87 per cent) and 2 males (13 per cent).

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[1]Sax, *op*. *cit*.

TABLE IX

COMPOSITION OF SAMPLE

Number of Students	Name of School	Level	Classes	Teachers
89	Richardson High Richardson, Texas	Second Semester	4	2
64	MacArthur High Irving, Texas	Second Semester	3	1
44	Irving High Irving, Texas	Fourth Semester	3	1
22	Nimitz High Irving, Texas	Fourth Semester	2	1
15	Mountain View College, Dallas, Texas	More than Four Semesters	1	1

Experimental Design

Students at three levels of instruction (second semes-
ter, fourth semester, and more than four semesters) were
tested on letters, tables, rough-draft reports, memorandums,
manuscripts, and invoices under the following five work con-
ditions: (1) arranged typewritten copy, (2) unarranged type-
written copy, (3) unarranged longhand copy, (4) unarranged
longhand copy with erasing, and (5) unarranged longhand copy
with erasing, typing and correcting one carbon copy and proof-
reading.

Five work conditions were used in order to arrive at the
percentage of time spent in keystroking, decision making,

typing longhand copy, erasing an original, and typing and correcting a carbon copy and proofreading. Work condition one involved typing from totally arranged typewritten copy. The students were not timed while they made the machine adjustments--only the actual typing time was timed. Therefore, the time spent on work condition one involved actual keystroking only. Work condition two involved typing from unarranged typewritten copy. The student was timed while making the machine adjustments and typing the job. By subtracting work condition one from work condition two, the time spent in decision-making was computed. Work condition three involved typing from unarranged longhand copy. By subtracting work condition two from work condition three, the time spent in typing longhand copy was computed. Work condition four involved typing from unarranged longhand copy and erasing. By subtracting work condition three from work condition four, the time spent in erasing on an original was computed. Work condition five involved typing from unarranged longhand copy, erasing, making one carbon copy, and proofreading. By subtracting work condition four from work condition five, the time spent in erasing, making one carbon copy and proofreading was computed.

The same letter, table, manuscript, memorandum, invoice, or report was not typed more than once so that practice effects would not be present. Each student typed a total of thirty jobs.

Campbell and Stanley[2] list the following internal and external validity factors which should be controlled:

Internal Validity	External Validity
History	Interaction of Testing and X
Maturation	
Testing	Interaction of Selection and X
Instrumentation	Reactive Arrangements
Regression	Multiple-X Interference
Selection	
Mortality	
Interaction of Selection and Maturation	

The controls on these factors in this study were:

1. History--The students were tested over a period of from sixteen to twenty days. Since the testing period was short, the possibility of extraneous events causing a change in typewriting ability was slight.

2. Maturation--Due to the shortness of the testing period, maturation was not of concern.

3. Testing--The study was not announced as a test to the participants but merely as part of their daily typewriting routine.

4. Instrumentation--All types of copy were equated as to difficulty level. Three scorers scored all papers. Explicit instructions were given on the scoring procedures.

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[2]Donald T. Campbell and Julian C. Stanley, _Experimental and Quasi-Experimental Designs for Research_ (Chicago, 1966), pp. 5-6.

5. Statistical Regression--The students were not selected on the basis of extreme scores.

6. Selection--The same students were used throughout the study.

7. Mortality--An attempt was made to control mortality by selecting a population large enough so that a 20 per cent loss would not affect the sample size. However, a 29 per cent loss was experienced, and no provision was made for replacement of these students.

8. Interaction of Testing and X--No pretests were given.

9. Interaction of Selection and X--It was assumed that the sample was typical; therefore, the results can be generalized to typewriting populations of the same level of instruction. However, an effort was made to use several classes (thirteen) at several schools (five) rather than confining the study to a few classes.

10. Reactive arrangements--Students were not told they were participating in a study.

11. Multiple X Interference--It is standard practice for typewriting students to be timed and tested on the six types of copy used in this study. The results are only generalizable to typewriting students at the same levels of instruction.

Test Content

Under each work condition, the students typed one of each type of copy (letter, table, rough-draft report,

memorandum, invoice, and manuscript). Work condition one
consisted of totally arranged typewritten copy. Placement
was indicated on the copy itself. Work condition two con-
sisted of unarranged typewritten copy. Placement was not
indicated. Work conditions three, four, and five consisted
of unarranged longhand copy with no placement indicated.
Appendix A contains copies of the materials used in the study.
The copy the students received did not contain the information
as to average word length, syllable intensity, high frequency
words, and standard words. Since all schools had elite type-
writers, the placements indicated are for elite machines only.

<div align="center">Test Order</div>

During the first six days of the testing period, jobs
under work condition one (arranged typewritten) were typed.
So that the typing order of the jobs could be determined,
each job was assigned a number; then a table of random num-
bers from Snedecor[3] was used. The jobs were typed in the
following order: (1) letters, (2) memorandums, (3) manu-
scripts, (4) invoices, (5) reports, and (6) tables.

After the first six days of arranged copy testing, eight
to twelve days were spent on unarranged copy testing. In
typing the unarranged copy, twelve days were allowed for
second-semester students with two jobs per day being typed.
For fourth-semester and more than four semester students,
eight days were allowed with three jobs per day being typed.

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[3]George W. Snedecor, _Statistical Methods_ (Iowa, 1962),
p. 10.

Since no incomplete work could be accepted for the study, it was important that adequate time be allowed for all students to finish each job. Due to second-semester students not having as much skill as fourth-semester and above students, more time was allowed for the second-semester students to type the jobs. To insure that margins would have to be changed, the job order for second-semester students was invoice--rough draft report, letter--table, and manuscript--memorandum. The job order for fourth-semester and above students was letter--table--rough draft report and memorandum--invoice--manuscript.

To determine the order in which the work conditions and copy would be typed, each work condition and copy group was assigned a number; then a table of random numbers from Snedecor[4] was used. The order for second-semester students is shown in Table X. The order for fourth-semester students is shown in Table XI.

Variables Controlled

In the study design, certain variables involved in the actual typing of the jobs and the training time of the students were considered important. An attempt was made to control these variables.

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[4]Snedecor, _Ibid._

TABLE X

ORDER OF UNARRANGED JOBS FOR SECOND SEMESTER

Day	Work Condition	Type of Copy
1	Unarranged longhand copy with no erasing	Invoice, Rough-draft report
2	Unarranged longhand copy with erasing	Letter, Table
3	Unarranged longhand copy with erasing, typing and correcting one carbon copy, and proofreading	Letter, Table
4	Unarranged longhand copy with erasing, typing and correcting one carbon copy, and proofreading	Invoice, Rough-draft report
5	Unarranged typewritten copy with no erasing	Manuscript, Memorandum
6	Unarranged typewritten copy with no erasing	Invoice, Rough-draft Report
7	Unarranged longhand copy with erasing, typing and correcting one carbon copy, and proofreading	Manuscript, Memorandum
8	Unarranged longhand copy with no erasing	Manuscript, Memorandum
9	Unarranged longhand copy with no erasing	Letter, Table
10	Unarranged typewritten copy with no erasing	Letter, Table
11	Unarranged longhand copy with erasing	Invoice, Rough-draft Report
12	Unarranged longhand copy with erasing	Manuscript, Memorandum

TABLE XI

ORDER OF UNARRANGED JOBS FOR FOURTH SEMESTER

Day	Work Condition	Type of Copy
1	Unarranged longhand copy with no erasing	Letter, Table, Report
2	Unarranged longhand copy with erasing, typing and correcting one carbon copy, and proofreading	Memorandum, Invoice, Manuscript
3	Unarranged longhand copy with erasing	Letter, Table, Report
4	Unarranged longhand copy with erasing, typing and correcting one carbon copy, and proofreading	Letter, Table, Report
5	Unarranged typewritten copy with no erasing	Letter, Table, Report
6	Unarranged longhand copy with no erasing	Memorandum, Invoice, Manuscript
7	Unarranged longhand copy with erasing	Memorandum, Invoice, Manuscript
8	Unarranged typewritten copy with no erasing	Memorandum, Invoice, Manuscript

Time Variable

It was important that the students be equated as to amount of typewriting instruction since additional instructional time could increase the student's typewriting ability. Therefore, all students in the study were in schools in which the standard two-semester school year was in effect.

Equipment and Supplies Variables

An attempt was made to control the following equipment and supplies variables:

1. All electric typewriters were used.

2. Erasing was the only correction procedure permitted.

3. Separate sheets of carbon paper were required for making carbon copies; no carbon packs were allowed.

4. On the work conditions in which erasing was necessary, the typing paper required was either sixteen or twenty weight bond--no erasable paper was used.

Test Administration

Time

The tests were administered during the last of April. It was important that students be as close as possible to their maximum skill development for that semester since the setting of standards was one of the purposes of the study. The last month of school was not chosen since it was felt there would be an increase in the number of absences due to extracurricular activities.

The testing period took from sixteen to twenty days. Table XII shows how the testing was broken down.

Production Typing Process

The teachers were provided with instruction sheets and time sheets. The students were given instruction sheets for each day of the testing period. Each student filled out an

TABLE XII

NUMBER OF DAYS FOR TESTING

Level of Instruction	Number of Days	Tests Given
Second Semester	2	IPAT Anxiety, Tennessee Self-Concept, Otis Lennon Test of Mental Maturity
	6	Arranged Type-written Tests
	12	Unarranged Type-written Tests
Fourth Semester and more than Four Semesters	2	IPAT Anxiety, Tennessee Self-Concept, Otis Lennon Test of Mental Maturity
	6	Arranged Type-written Tests
	8	Unarranged Type-written Tests

information sheet. Invoice and memorandum forms were pro-
vided for the students. Copies of these sheets are in

Appendix B.

The teacher's duties during the testing period were:

(1) go over the instruction sheets with the students--no

information was given by the teacher other than the informa-

tion on the instruction sheet; (2) pass out any needed forms

for that day's testing; (3) time the typing of the jobs; and

(4) record the time on the time sheets provided.

During the unarranged typewriting testing, second-semester students needed to finish two jobs per day for the study and fourth-semester and more than four-semester students needed to finish three jobs per day. It was felt that the validity of the study would be damaged if some students finished their typing assignments before the end of the period and other students were still working. Therefore, to provide for the different skill levels of the students, additional copy was provided for each type of job so that all students would be typing the entire period. However, these addditional jobs typed by the students were not used in the study.

Copy Difficulty

No copy was available for production typewriting that was controlled as to syllable intensity, average word length, high frequency words, and total standard words. Therefore, it was necessary to write copy controlled for these variables. The level of difficulty was controlled for the letters, reports, memorandums, and manuscripts. The difficulty factors for each particular copy are indicated on the copy in Appendix A. The first 1,000 words in the Perry list were used in computing high frequency words. The copy was average to high average in difficulty. The syllable intensity ranged from 1.5 to 1.6; the average word length ranged from 5.6 to 5.8; the high frequency words ranged from 75 to 79 per cent; and the total length of the copy was from 165 to 210 words.

The letters were modified block style with blocked para-
graphs. The letters contained no special features such as
attention lines, subject lines, enclosure notations, or PS
notations. The manuscript copy was unbound and contained
two footnotes. The rough-draft reports contained six proof-
readers's marks per copy. The tables were open style of
approximately 115 words with four columns--one column of
alphabetic characters and three columns of numeric charac-
ters. The invoices contained approximately 120 words to be
filled in.

Test Scoring

The tests were scored by three graders who worked
closely together to insure a maximum amount of consistency
in grading. On work condition one it was necessary to mark
only keystroking errors since the student was given exact
directions on how to set up the copy. On work conditions
two through five, the student had to make decisions as to
how to set up the copy. Therefore, two types of errors were
recorded--decision making and keystroking errors. Gross
words per minute were figured for all types of copy.

Test Instruments

The IPAT Anxiety Scale, the Tennessee Self-Concept Scale,
and the Otis-Lennon Mental Ability Test were given before the
production typewriting testing. The major portion of two
class periods was involved in giving these tests. The test

booklets for each instrument contained adequate instructions for the student. The only timed test was the Otis-Lennon which was timed for forty minutes. The IPAT Anxiety Scale took approximately ten minutes for the student to complete, and the Tennessee Self Concept Scale took approximately thirty minutes.

Analysis of Data

Three-way analyses of variance were run on the three levels of instruction, the five work conditions, and the six types of copy to determine if there were significant differences in (1) keystroking speed, (2) keystroking errors, and (3) decision-making errors. The design was a three (levels of instruction) by five (work conditions) by six (types of copy). For each of the three-way analyses of variance, multiple comparisons were run on the three variables (level of instruction, work condition, and copy) using Scheffe's F test.[5]

One-way analyses of variance were run at each of the three levels of copy to determine if there were significant differences in (1) keystroking speed, (2) keystroking errors, (3) decision-making speed, and (4) decision-making errors. The design was a one (level of instruction) by six (types of copy). A Scheffe F test was then run on keystroking speed,

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[5]Ferguson, op. cit., p. 270.

keystroking errors, decision-making speed, and decision-making errors at each of the three levels of instruction.

Two-way analyses of variance were run at each of the three levels of instruction to determine if there were significant differences between: (1) keystroking speed on longhand copy and keystroking speed on typewritten copy and (2) keystroking errors on longhand copy and keystroking errors on typewritten copy. The design was a two (work conditions two and three) by six (types of copy).

Pearson product-moment correlations were run on: (1) decision-making speed and scores on the IPAT Anxiety Scale, (2) decision-making speed and scores on the Tennessee Self Concept Scale, and (3) decision-making speed and scores on the Otis-Lennon Mental Ability Test. The significance of these correlations was tested with the following formula:

$$t = r \sqrt{\frac{N - 2}{1 - r^2}} \quad [6]$$

Percentages of time involved in the production typewriting activities were computed by taking the time involved on each work condition. These activities were:

(A) Keystroking time = time spent on work condition one

(B) Decision-making time = time spent on work condition two minus work condition one

(C) Typing from longhand copy = time spent on work condition three minus work condition two

[6]Ferguson, _Ibid._, p. 169.

(D) Erasing an original = time spent on work condition four minus work condition three

(E) Typing a carbon copy, erasing and correcting the carbon, and proof-reading = time spent on work condition five minus work condition four minus time spent erasing the original

The following formula was applied in computing the percentages:

A + B + C + D + E = F (100 per cent).

CHAPTER IV

FINDINGS

The major purposes of this study were concerned with:
(1) the percentages of time spent in the activities of
production typewriting; (2) the correlation between anxiety
level and decision-making time, self concept and decision-
making time, and IQ and decision-making time; (3) the dif-
ferences in keystroking speed on selected types of production
copy; (4) the differences in keystroking errors on selected
types of production copy; (5) the differences in decision-
making speed on selected types of production copy; (6) the
differences in decision-making errors on selected types of
production copy; (7) the differences in keystroking speed
and errors between typewritten copy and longhand copy; (8)
the mean gross words per minute rate on selected types of
copy; and (9) the mean number of errors made on selected
types of copy. The findings are presented in the order given
above in this chapter.

Percentage of Time Spent in Production Activities

Table XIII shows the percentages of time spent by second-
semester students on each production activity for each type
of copy.

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TABLE XIII

PERCENTAGE OF TIME ON PRODUCTION ACTIVITIES
FOR SECOND-SEMESTER STUDENTS

Type of Copy	Production Activity	Per Cent of Time
Letters	Keystroking	50.91
	Decision making	1.22
	Typing from longhand copy	.80
	Erasing (original only)	10.14
	Making a carbon, erasing, proofreading	36.93
	Total	100.00
Tables	Keystroking	35.58
	Decision making	20.65
	Typing from longhand copy	11.98
	Erasing (original only)	5.69
	Making a carbon, erasing, proofreading	26.10
	Total	100.00
Reports	Keystroking	40.48
	Decision making	12.87
	Typing from longhand copy	15.61
	Erasing (original only)	14.08
	Making a carbon, erasing, proofreading	16.96
	Total	100.00
Memorandums	Keystroking	52.53
	Decision making	4.49
	Typing from longhand copy	14.24
	Erasing (original only)	12.62
	Making a carbon, erasing, proofreading	16.12
	Total	100.00
Invoices	Keystroking	54.21
	Decision making	7.30
	Typing from longhand copy	3.60
	Erasing (original only)	11.30
	Making a carbon, erasing, proofreading	23.59
	Total	100.00
Manuscripts	Keystroking	54.31
	Decision making	6.20
	Typing from longhand copy	1.85
	Erasing (original only)	15.04
	Making a carbon, erasing, proofreading	22.60
	Total	100.00

The second-semester student spent more time in keystroking on manuscripts (54.31 per cent) than on any other type of copy. The student spent 50.49 per cent of his time in keystroking on all types of copy combined with the exception of tables. The student spent the least amount of time in keystroking on tables (35.58 per cent). The most decision-making time was spent on tables (20.65 per cent), and the least decision-making time was spent on letters (1.22 per cent). There was a large variance in time spent on typing from longhand copy; the range was from .80 per cent for letters to 15.61 per cent for reports. Erasing on an original took from 5.69 per cent to 15.04 per cent of the production time. The student spent less time erasing an original on tables than on any other type of copy (5.69 per cent). Making one carbon, erasing, and proofreading took from 16.12 per cent to 36.93 per cent of the production time. Keystroking consumed the largest amount of time of any production activity. Approximately one-half of the production time was spent in keystroking. The next most significant activity was the combination of erasing an original and making a carbon, erasing and proofreading. These two activities combined consumed 35.20 per cent of the student's time in the second semester of instruction--approximately one-third of the total time.

Table XIV shows the percentage of time spent by the fourth-semester student on each production activity for each type of copy.

TABLE XIV

PERCENTAGE OF TIME ON PRODUCTION ACTIVITIES
FOR FOURTH-SEMESTER STUDENTS

Type of Copy	Production Activity	Per Cent of Time
Letters	Keystroking	66.10
	Decision making	5.16
	Typing from longhand copy	17.83
	Erasing (orignal only)	4.58
	Making a carbon, erasing, proofreading	6.33
	Total	100.00
Tables	Keystroking	38.74
	Decision making	19.18
	Typing from longhand copy	21.13
	Erasing (original only)	3.53
	Making a carbon, erasing, proofreading	17.42
	Total	100.00
Reports	Keystroking	47.97
	Decision making	10.10
	Typing from longhand copy	17.73
	Erasing (original only)	10.13
	Making a carbon, erasing, proofreading	14.07
	Total	100.00
Memorandums	Keystroking	63.43
	Decision making	5.48
	Typing from longhand copy	5.75
	Erasing (original only)	10.80
	Making a carbon, erasing, proofreading	14.54
	Total	100.00
Invoices	Keystroking	51.56
	Decision making	9.71
	Typing from longhand copy	3.03
	Erasing (original only)	15.70
	Making a carbon, erasing, proofreading	20.00
	Total	100.00
Manuscripts	Keystroking	52.42
	Decision making	4.87
	Typing from longhand copy	4.38
	Erasing (original only)	16.82
	Making a carbon, erasing, proofreading	21.51
	Total	100.00

The fourth-semester student spent more time in keystroking on letters (66.10 per cent) than on any other type of copy. The student spent 56.30 per cent of his time in keystroking on all types of copy combined with the exception of tables. The least amount of keystroking time was spent on tables (38.74 per cent). Tables required more decision-making time with 19.18 per cent of the time being spent here. The variance in time spent on longhand copy was great for the fourth-semester student as well as the second-semester student. The range for fourth semester was from 3.03 per cent to 21.13 per cent. The fourth-semester student spent less time in erasing an original on letters, tables, reports, and memorandums than did the second-semester student. The fourth-semester student spent less time erasing an original on tables than on any other type of copy. The time spent in making a carbon, erasing, and proofreading was reduced from the second to the fourth semester. The range for the second-semester student was from 16.12 per cent to 36.93 per cent while the range for the fourth-semester student was from 6.33 per cent to 21.51 per cent. The fourth-semester student spent 25.91 per cent of his time in the combined activities of erasing an original and making a carbon, erasing the carbon, and proofreading.

Table XV shows the percentage of time spent by the student with more than four semesters of instruction on each production activity for each type of copy.

TABLE XV

PERCENTAGE OF TIME ON PRODUCTION ACTIVITIES FOR
STUDENTS WITH MORE THAN FOUR SEMESTERS

Type of Copy	Production Activity	Per Cent of Time
Letters	Keystroking	56.80
	Decision making	23.59
	Typing from longhand copy	5.47
	Erasing (original only)	7.50
	Making a carbon, erasing, proofreading	6.64
	Total	100.00
Tables	Keystroking	35.30
	Decision making	30.00
	Typing from longhand copy	5.18
	Erasing (original only)	11.20
	Making a carbon, erasing, proofreading	18.32
	Total	100.00
Reports	Keystroking	49.87
	Decision making	38.46
	Typing from longhand copy	.48
	Erasing (original only)	4.56
	Making a carbon, erasing, proofreading	6.63
	Total	100.00
Memorandums	Keystroking	55.39
	Decision making	24.69
	Typing from longhand copy	.35
	Erasing (original only)	9.27
	Making a carbon, erasing, proofreading	10.30
	Total	100.00
Invoices	Keystroking	59.12
	Decision making	12.08
	Typing from longhand copy	5.15
	Erasing (original only)	10.05
	Making a carbon, erasing, proofreading	13.60
	Total	100.00
Manuscripts	Keystroking	44.07
	Decision making	15.78
	Typing from longhand copy	5.33
	Erasing (original only)	11.58
	Making a carbon, erasing, proofreading	23.24
	Total	100.00

For the student with more than four semesters of instruction, more time was spent in keystroking on invoices (59.12 per cent) than on any other type of copy. The student spent 53.05 per cent of his time in keystroking on all types of copy with the exception of tables. The least amount of keystroking time was spent on tables (35.30 per cent). The student with more than four semesters spent more time in decision making on all types of copy than did students at the second or fourth semesters. Students at this level spent from 12.08 per cent to 38.46 per cent of the time in decision making. Keystroking showed a decrease from the keystroking time of the fourth-semester students. The range of time spent in typing from longhand copy was not as great at this level (.35 per cent to 5.47 per cent) as at the other two levels of instruction. The time spent in erasing an original ranged from 4.56 per cent to 11.58 per cent. The time spent in making a carbon, erasing, and proofreading ranged from 6.63 per cent to 23.24 per cent. The student with more than four semesters spent 22.15 per cent of his time in the combined activities of erasing an original and making a carbon, erasing the carbon, and proofreading.

When the percentages of time spent in each production activity for all types of copy at each level of instruction are combined, certain patterns are evident. Table XVI on the following page shows these combined percentages.

TABLE XVI

MEAN PERCENTAGES OF TIME ON PRODUCTION ACTIVITIES FOR
ALL TYPES OF COPY AT ALL LEVELS OF INSTRUCTION

Level	Production Activity	Per Cent of Time
Second Semester	Keystroking	48.00
	Decision making	8.79
	Typing from longhand copy	8.01
	Erasing (original only)	11.48
	Making a carbon, erasing, proofreading	23.72
	Total	100.00
Fourth Semester	Keystroking	53.37
	Decision making	9.08
	Typing from longhand copy	11.64
	Erasing (original only)	10.26
	Making a carbon, erasing, proofreading	15.65
	Total	100.00
More than Four Semesters	Keystroking	50.09
	Decision making	24.10
	Typing from longhand copy	3.66
	Erasing (original only)	9.02
	Making a carbon, erasing, proofreading	13.13
	Total	100.00

The second-semester student spent 11.48 per cent of the
time erasing an original compared to 10.26 per cent spent by
the fourth-semester student and 9.02 per cent spent by the
more than four semester student. The second-semester student
spent 23.73 per cent of the time making a carbon, erasing the
carbon, and proofreading compared to 15.65 per cent for the
fourth-semester student and 13.13 per cent for the more than
four semester student. The students with more than four
semesters of instruction spent less time typing from longhand

copy (3.66 per cent) than did second-semester students (8.01 per cent) or fourth-semester students (11.64 per cent). Decision-making time was approximately the same for the second-semester and fourth-semester student (8.79 per cent and 9.08 per cent respectively). However, the more than four semester student spent 24.10 per cent of the time in decision making which was a considerable increase over the second and fourth semester student.

When erasing an original and making a carbon, correcting the carbon, and proofreading are combined, a reduction in time can be seen at each level of instruction. For example, the combination of the two activities involved 35.20 per cent of the time at the second-semester level, 25.91 per cent of the time at the fourth-semester level, and 22.15 per cent of the time at the more than four semesters level. Thus, the second-semester student spent approximately one-third of his time engaged in erasing an original, making a carbon, correcting the carbon, and proofreading. The fourth-semester student spent one-fourth of his time in these activities, and the student with more than four semesters spent slightly over one-fifth of his time in these activities. At all levels of instruction, approximately 50 per cent of the time was spent in keystroking.

Decision-Making Factors

Table XVII shows the correlation of the scores on the IPAT Anxiety Scale, Tennessee Self Concept Scale, and Otis-Lennon Mental Ability Test with decision-making time.

TABLE XVII

CORRELATION OF IPAT ANXIETY SCALE, TENNESSEE
SELF CONCEPT SCALE, AND OTIS-LENNON MENTAL
ABILITY TEST WITH DECISION-MAKING TIME

Level of Instruction	IPAT Anxiety	Tennessee Self Concept	Otis-Lennon Mental Ability
Second Semester	0.0527	-0.1051	-0.2531
Fourth Semester	-0.0110	0.0023	-0.0931
More than four semesters	-0.0152	-0.0994	-0.6021
All levels combined	0.0677	-0.0750	-0.1176

The significance of the correlations was tested by the following formula:

$$t = r\sqrt{\frac{N-2}{1-r^2}} \quad {}^{1}$$

Table XVIII shows the "t" values for each factor at all levels.

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[1]Ibid., p. 169.

TABLE XVIII

THE "t" VALUES FOR IPAT ANXIETY SCORE, TENNESSEE SELF
CONCEPT SCORE, AND OTIS-LENNON MENTAL ABILITY
SCORE CORRELATED WITH DECISION-MAKING TIME

Level of Instruction	IPAT Anxiety	Tennessee Self Concept	Otis-Lennon Mental Ability
Second Semester	.6487	1.2980	3.2148*
Fourth Semester	.0880	.0184	.7480
More than four semesters	.0548	.3602	2.7191**
All levels combined	1.0751	1.1916	1.8760

*Significant at .05 level.

**Significant at .01 and .05 levels.

The "t" values indicate that there was a significant correlation between IQ and decision-making time at the second semester and more than four semester levels. IQ and decision-making time did not show a significant correlation at the fourth-semester level. Table XVII shows that there is a negative correlation between IQ and decision-making speed which indicates that as IQ increased the decision-making time decreased.

The correlations between the scores on the IPAT Anxiety Scale and the Tennessee Self Concept Scale with decision-making time were not significant at any level of instruction.

The norms for the IPAT Anxiety Scale were established on a sample size of 525 teenagers, 262 boys and 263 girls. The mean for the sample was 31.5 with a standard deviation of 12.2. In comparison, the mean on the sample used in this study was 34.29 with a standard deviation of 11.99.

The norms for the Tennessee Self Concept Scale were established on a sample size of 626 people. The mean for the sample on the "Total Positive" score was 345.57, and the standard deviation was 30.70. In comparison, the mean on the sample used in this study was 329.54 with a standard deviation of 36.20.

To determine if there was a significant difference in the variances of the sample of this study and the sample on which the norms were established, the variance ratio was computed using the following formula:[2]

$$F = s_1{}^2/s_2{}^2$$

The F ratio was found to be 1.03 on the IPAT Anxiety Scale and 1.39 on the Tennessee Self Concept Scale. Neither ratio was statistically significant at the .05 level. Therefore, no significant difference was found between the variances of the samples used in the establishment of the norms and the sample used in this study on either the IPAT Anxiety Scale or the Tennessee Self Concept Scale.

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[2]Ibid., p. 165.

Differences in Keystroking Speed

A three-way analysis of variance showed a significant difference in keystroking speed among all variables (copy, levels of instruction, and work conditions). Table XIX shows these differences.

TABLE XIX

DIFFERENCES IN KEYSTROKING SPEED ON ALL TYPES OF COPY,
AT ALL LEVELS, AND UNDER ALL WORK CONDITIONS

Source	F Ratio
Three levels of instruction	859.28*
Five work conditions	787.43*
Six types of copy	673.74*
Levels-work conditions	19.13*
Levels-copy	18.24*
Work conditions-copy	23.07*
Levels-work conditions-copy	4.08*

*Significant at .01 and .05 levels.

To discover where the major differences in keystroking speed existed, a multiple comparison test was run. Table XX reveals the differences between types of copy.

There were significant differences in keystroking speed at all levels on all types of copy with the exception of two types of copy. No significant difference in keystroking speed was revealed between a letter and a report or between a table and an invoice. At all levels of instruction, students typed

TABLE XX

COMPARISON OF KEYSTROKING SPEED ON SIX TYPES
OF COPY FOR ALL LEVELS COMBINED

Comparison of Copy	F Ratio
Letter, table	645.03*
Letter, report	.05
Letter, memorandum	6.20*
Letter, invoice	587.30*
Letter, manuscript	29.04*
Table, report	657.08*
Table, memorandum	777.65*
Table, invoice	1.35
Table, manuscript	400.35*
Report, memorandum	5.08*
Report, invoice	598.81*
Report, manuscript	31.64*
Memorandum, invoice	714.14*
Memorandum, manuscript	62.06*
Invoice, manuscript	355.16*

*Significant at both .01 and .05 levels.

a table with approximately the same keystroking speed as an
invoice and typed a letter with approximately the same key-
stroking speed as a report.

In order to further explain the differences in the copy,
a table with the mean speed and standard deviation follows
all comparison tables.

The mean keystroking speed and the standard deviation for the different types of copy are shown in Table XXI.

TABLE XXI

MEAN KEYSTROKING SPEED FOR ALL LEVELS COMBINED

Type of Copy	Keystroking Speed in Gross Words per Minute	Standard Deviation
Table	14.79	7.12
Invoice	15.40	5.27
Manuscript	25.29	9.31
Letter	28.12	10.99
Report	28.24	12.13
Memorandum	29.42	11.32

The small differences in keystroking speed between tables and invoices and letters and reports can be seen by looking at the mean differences. The difference in mean speed between the table and the invoice was .61 and the difference between the letter and the report was .12.

In order to determine the differences in keystroking speed on the types of copy at each level of instruction, multiple comparison tests were run by levels. Table XXII shows the difference in keystroking speed at level one (second semester).

TABLE XXII

COMPARISON OF KEYSTROKING SPEED ON
SIX TYPES OF COPY AT LEVEL ONE

Comparison of Copy	F Ratio
Letter, table	49.79*
Letter, report	30.16*
Letter, memorandum	4.39*
Letter, invoice	104.95*
Letter, manuscript	0.98
Table, report	157.46*
Table, memorandum	83.75*
Table, invoice	10.16*
Table, manuscript	36.75*
Report, memorandum	11.54*
Report, invoice	247.63*
Report, manuscript	42.07*
Memorandum, invoice	152.27*
Memorandum, manuscript	9.55*
Invoice, manuscript	85.56*

*Significant at .01 and .05 levels.

No significant difference was found in keystroking speed between the letter and the manuscript at the second semester of instruction. All other differences were significant.

Table XXIII shows the mean keystroking speed and standard deviation for the different types of copy at level one (second semester).

TABLE XXIII

MEAN KEYSTROKING SPEED AT LEVEL ONE

Type of Copy	Keystroking Speed in Gross Words per Minute	Standard Deviation
Invoice	14.78	2.92
Table	20.08	4.37
Manuscript	30.16	5.52
Letter	31.81	6.82
Memorandum	35.29	2.92
Report	40.94	8.91

The difference in the speed between the letter and the manuscript was only 1.65 gross words per minute.

Table XXIV shows the comparison of keystroking speed on the different types of copy at level two (fourth semester).

No significant differences were found in keystroking speed between letters and memorandums and tables and invoices at the fourth semester of instruction. However, a significant difference was found between all other combinations of copy. The fourth semester student struck the keys at approximately the same rate of speed on letters and memorandums and on tables and invoices.

TABLE XXIV

COMPARISON OF KEYSTROKING SPEED ON
SIX TYPES OF COPY AT LEVEL TWO

Comparison of Copy	F Ratio
Letter, table	70.53*
Letter, report	12.44*
Letter, memorandum	0.07
Letter, invoice	96.68*
Letter, manuscript	9.48*
Table, report	142.21*
Table, memorandum	75.18*
Table, invoice	2.06
Table, manuscript	28.29*
Report, memorandum	10.59*
Report, invoice	178.48*
Report, manuscript	43.64*
Memorandum, invoice	102.12*
Memorandum, manuscript	11.23*
Invoice, manuscript	45.61*

*Significant at .01 and .05 levels.

Table XXV shows the mean keystroking speed and standard deviation for the different types of copy for the fourth semester of instruction.

TABLE XXV

MEAN KEYSTROKING SPEED AT LEVEL TWO

Type of Copy	Keystroking Speed in Gross Words per Minute	Standard Deviation
Invoice	25.38	3.69
Table	28.48	4.98
Manuscript	40.00	5.54
Letter	46.66	5.86
Memorandum	47.26	5.91
Report	54.30	6.86

The insignificant difference between letters and memorandums and tables and invoices is pointed out in this table. The mean difference between letters and memorandums was .60, and the mean difference between tables and invoices was 3.10.

Table XXVI shows the comparison of keystroking speed on the different types of copy at level three (more than four semesters).

As can be seen from the table, there were no significant differences in keystroking speed among letters, reports,

TABLE XXVI

COMPARISON OF KEYSTROKING SPEED ON
SIX TYPES OF COPY AT LEVEL THREE

Comparison of Copy	F Ratio
Letter, table	8.82*
Letter, report	0.15
Letter, memorandum	0.27
Letter, invoice	8.35*
Letter, manuscript	0.68
Table, report	11.24*
Table, memorandum	6.00*
Table, invoice	0.01
Table, manuscript	4.60*
Report, memorandum	0.82
Report, invoice	10.72*
Report, manuscript	1.46
Memorandum, invoice	5.62*
Memorandum, manuscript	0.09
Invoice, mansucript	4.27*

*Significant at .01 and .05 levels.

memorandums, and manuscripts and between tables and invoices

at more than four semesters of instruction.

Table XXVII shows the mean keystroking speed and standard deviation for the different types of copy for more than four semesters of instruction.

TABLE XXVII

MEAN KEYSTROKING SPEED AT LEVEL THREE

Type of Copy	Keystroking Speed in Gross Words per Minute	Standard Deviation
Table	19.80	4.36
Invoice	20.27	3.01
Manuscript	32.47	9.09
Memorandum	34.27	7.12
Letter	37.33	7.42
Report	39.60	9.86

The student that has had more than four semesters of typewriting struck the keys at approximately the same speed on tables and invoices. This keystroking speed was considerably lower than that on manuscripts, memorandums, letters, and reports.

Differences in Keystroking Errors

A three-way analysis of variance showed that there were significant differences in keystroking errors among all variables. Table XXVIII shows these differences.

TABLE XXVIII

DIFFERENCES IN KEYSTROKING ERRORS ON ALL
TYPES OF COPY, AT ALL LEVELS, AND
UNDER ALL WORK CONDITIONS

Source	F Ratio
Three levels of instruction	156.60*
Five work conditions	210.41*
Six types of copy	48.32*
Levels-work conditions	22.35*
Levels-copy	3.76*
Work conditions-copy	5.05*
Levels-work conditions-copy	1.63*

*Significant at .05 level

The significantly high F ratio indicates that keystroking errors did differ between the second semester, fourth semester, and more than four semesters of instruction on the six types of copy compared. A multiple comparison test was run to discover where the major differences in keystroking errors existed. Table XXIX shows these differences.

TABLE XXIX

COMPARISON OF KEYSTROKING ERRORS ON SIX TYPES OF
COPY ON ALL LEVELS OF INSTRUCTION COMBINED

Comparison of Copy	F Ratio
Letter, table	20.20*
Letter, report	24.49*
Letter, memorandum	26.14*
Letter, invoice	6.70*
Letter, manuscript	15.97*
Table, report	89.18*
Table, memorandum	92.29*
Table, invoice	3.63*
Table, manuscript	72.10*
Report, memorandum	0.03
Report, invoice	56.81*
Report, manuscript	0.91
Memorandum, invoice	59.30*
Memorandum, manuscript	1.24
Invoice, manuscript	43.36*

*Significant at .01 and .05 levels.

There were no significant differences in keystroking errors among reports, memorandums, and manuscripts. At all levels, students made approximately the same number of keystroking errors on reports as they did on manuscripts and memorandums.

The mean keystroking errors for the different types of copy are shown in Table XXX.

TABLE XXX

MEAN KEYSTROKING ERRORS ON ALL LEVELS COMBINED

Type of Copy	Total Keystroking Errors	Standard Deviation
Table	3.17	3.79
Invoice	4.05	4.19
Letter	5.24	5.94
Manuscript	7.08	7.53
Report	7.52	8.34
Memorandum	7.59	7.46

Students at all levels made the least number of errors on tables, invoices, and letters (three to five) and the most number of errors on manuscripts, reports, and memorandums (seven to seven and one-half).

To determine the differences in keystroking errors on the types of copy at each level of instruction, multiple comparison tests were run by levels. Table XXXI shows the differences in keystroking errors at level one (second semester).

TABLE XXXI

COMPARISON OF KEYSTROKING ERRORS ON
SIX TYPES OF COPY AT LEVEL ONE

Comparison of Copy	F Ratio
Letter, table	1.45
Letter, report	15.16*
Letter, memorandum	11.19*
Letter, invoice	0.06
Letter, manuscript	9.08*
Table, report	25.99*
Table, memorandum	20.71*
Table, invoice	0.90
Table, manuscript	17.79*
Report, memorandum	0.30
Report, invoice	17.40*
Report, manuscript	0.77
Memorandum, invoice	12.96*
Memorandum, manuscript	0.11
Invoice, manuscript	10.68*

*Significant at .01 and .05 levels.

After two semesters of typewriting instruction, there were no significant differences in the number of keystroking errors among letters, tables, and invoices, and among reports, memorandums, and manuscripts.

Table XXXII shows the mean keystroking errors and standard deviation for the different types of copy at level one (second semester).

TABLE XXXII

MEAN KEYSTROKING ERRORS AT LEVEL ONE

Type of Copy	Total Keystroking Errors	Standard Deviation
Table	6.10	4.13
Invoice	7.86	5.15
Letter	8.33	5.16
Manuscript	13.90	8.10
Memorandum	14.52	8.68
Report	15.53	10.14

The number of errors on letters, tables, and invoices ranged from six to eight. There was a definite increase in errors on reports, memorandums, and manuscripts with the error range being from thirteen to fifteen. Students at this level made twice as many keystroking errors on reports, memorandums, and manuscripts as they did on letters, tables, and invoices.

Table XXXIII shows the comparison of keystroking errors on the different types of copy at level two (fourth semester).

TABLE XXXIII

COMPARISON OF KEYSTROKING ERRORS ON
SIX TYPES OF COPY AT LEVEL TWO

Comparison of Copy	F Ratio
Letter, table	0.02
Letter, report	4.63*
Letter, memorandum	1.97
Letter, invoice	0.13
Letter, manuscript	4.74*
Table, report	5.28*
Table, memorandum	2.40*
Table, invoice	0.04
Table, manuscript	5.40*
Report, memorandum	0.56
Report, invoice	6.30*
Report, manuscript	0.00
Memorandum, invoice	3.01*
Memorandum, manuscript	0.60
Invoice, manuscript	6.42*

*Significant at .05 level.

After the fourth semester of instruction, there were
no significant differences among keystroking errors on
invoices, tables, and letters. There were also no significant
differences in keystroking errors among reports, memorandums,
and manuscripts.

Table XXXIV shows the mean keystroking errors and standard deviation for the different types of copy for the fourth semester of instruction.

TABLE XXXIV

MEAN KEYSTROKING ERRORS AT LEVEL TWO

Type of Copy	Total Keystroking Errors	Standard Deviation
Invoice	3.45	2.42
Table	3.84	3.08
Letter	4.12	3.90
Memorandum	6.72	4.74
Report	8.12	5.76
Manuscript	8.16	7.11

The approximate number of errors made on invoices, tables, and letters was four per copy. The number of errors almost doubled on memorandums, reports, and manuscripts with an average of eight per copy. Students at semester two made from 6.10 to 15.53 keystroking errors compared to from 3.45 to 8.16 for students at semester four.

Table XXXV shows the comparison of keystroking errors on the different types of copy at level three (more than four semesters of instruction).

TABLE XXXV

COMPARISON OF KEYSTROKING ERRORS ON
SIX TYPES OF COPY AT LEVEL THREE

Comparison of Copy	F Ratio
Letter, table	0.09
Letter, report	0.00
Letter, memorandum	0.06
Letter, invoice	0.06
Letter, manuscript	0.14
Table, report	0.22
Table, memorandum	0.48
Table, invoice	0.07
Table, manuscript	0.67
Report, memorandum	0.05
Report, invoice	0.07
Report, manuscript	0.12
Memorandum, invoice	0.24
Memorandum, manuscript	0.02
Invoice, manuscript	0.38

This table reveals that there were no significant differences at level three in keystroking errors on any combination of copy.

Table XXXVI shows the mean keystroking errors and standard deviation for the different types of copy for level three (more than four semesters of instruction).

TABLE XXXVI

MEAN KEYSTROKING ERRORS AT LEVEL THREE

Type of Copy	Total Keystroking Errors	Standard Deviation
Table	3.27	3.12
Invoice	4.00	3.32
Letter	4.87	4.09
Report	5.00	3.46
Memorandum	5.80	4.54
Manuscript	6.27	7.15

The range of keystroking errors made for more than four semesters of instruction was from three to six for all types of copy.

Differences in Decision-Making Speed

One-way analyses of variance and multiple comparison tests were run to determine if there were significant differences in decision-making speed on six types of copy. Table XXXVII shows these differences at level one (second semester of instruction).

There were no significant differences in decision-making speed among letters memorandums, manuscripts, and invoices.

TABLE XXXVII

COMPARISON OF DECISION-MAKING SPEED ON
SIX TYPES OF COPY AT LEVEL ONE

Comparison of Copy	F Ratio
Letter, table	92.98*
Letter, report	31.77*
Letter, memorandum	0.12
Letter, invoice	2.85
Letter, manuscript	0.50
Table, report	16.05*
Table, memorandum	86.51*
Table, invoice	63.28*
Table, manuscript	79.85*
Report, memorandum	28.04*
Report, invoice	15.59*
Report, manuscript	24.30*
Memorandum, invoice	1.81
Memorandum, manuscript	0.13
Invoice, manuscript	0.96

*Significant at .01 and .05 levels.

Table XXXVIII shows the mean decision-making speed for the
different types of copy for the second semester of instruc-
tion.

TABLE XXXVIII

MEAN DECISION-MAKING SPEED AT LEVEL ONE

Type of Copy	Decision-Making Speed in Gross Words per Minute*	Standard Deviation
Letter	1.61	3.09
Memorandum	2.07	6.60
Manuscript	2.57	5.36
Invoice	3.90	3.64
Report	9.27	6.16
Table	14.71	6.04

*The number of words per minute slower a student typed when setting up unarranged material as opposed to setting up arranged material.

Table XXXVII revealed that there were no significant differences in decision-making speed among letters, memorandums, manuscripts, and invoices. Table XXXVIII shows that the speed spread from letters to invoices was only 2.29 words per minute. The second semester student spent more time setting up tables and reports than any other type of copy.

The differences in decision-making speed on six types of copy at level two (fourth semester of instruction) are shown in Table XXXIX.

TABLE XXXIX

COMPARISON OF DECISION-MAKING SPEED ON
SIX TYPES OF COPY AT LEVEL TWO

Comparison of Copy	F Ratio
Letter, table	31.55*
Letter, report	3.25*
Letter, memorandum	0.00
Letter, invoice	0.32
Letter, manuscript	0.32
Table, report	14.55*
Table, memorandum	31.03*
Table, invoice	25.54*
Table, manuscript	38.19*
Report, memorandum	3.08**
Report, invoice	1.54
Report, manuscript	5.60*
Memorandum, invoice	0.27
Memorandum, manuscript	0.37
Invoice, manuscript	1.27

*Significant at .01 and .05 levels.

**Significant at .05 level only.

There were no significant differences in decision-making speed between invoices and reports and among manuscripts, letters, memorandums, and invoices.

Table XL shows the mean decision-making speed for the different types of copy for the fourth semester.

TABLE XL

MEAN DECISION-MAKING SPEED AT LEVEL TWO

Type of Copy	Decision-Making Speed in Gross Words per Minute	Standard Deviation
Manuscript	2.44	5.35
Letter	3.71	6.99
Memorandum	3.82	5.62
Invoice	4.98	3.48
Report	7.79	6.22
Table	16.41	6.52

The difference in decision-making speed between invoices and reports was 2.81 words per minute. The range for manuscripts, letters, memorandums, and invoices was from 2.44 to 4.98 (a difference of 2.54). The range of time involved in decision making for the fourth-semester student was from 2.44 to 16.41 compared with 1.61 to 14.71 for the second-semester student. Students with four semesters of instruction spent more time setting up tables and reports than any other type of copy.

Table XLI shows the difference in decision-making speed on all types of copy at level three (more than four semesters).

TABLE XLI

COMPARISON OF DECISION-MAKING SPEED ON
SIX TYPES OF COPY AT LEVEL THREE

Comparison of Copy	F Ratio
Letter, table	0.09
Letter, report	2.44
Letter, memorandum	0.02
Letter, invoice	1.99
Letter, manuscript	0.43
Table, report	1.61
Table, memorandum	0.02
Table, invoice	2.90
Table, manuscript	0.91
Report, memorandum	1.99
Report, invoice	8.84*
Report, manuscript	4.93**
Memorandum, invoice	2.44
Memorandum, manuscript	0.66
Invoice, manuscript	0.56

*Significant at .01 and .05 levels.

**Significant at .05 level only.

The only significant differences in decision-making speed at level three were between reports and invoices and reports and manuscripts.

Table XLII shows the mean decision-making speed for the different types of copy for more than four semesters of instruction.

TABLE XLII

MEAN DECISION-MAKING SPEED AT LEVEL THREE

Type of Copy	Decision-Making Speed in Gross Words per Minute	Standard Deviation
Invoice	1.00	6.38
Manuscript	5.26	7.16
Letter	9.00	7.25
Memorandum	9.87	7.65
Table	10.67	7.16
Report	17.87	8.02

The range of time involved in decision making was greater
at level three than at either of the other two levels. At
this level also, the time involved in decision making increased
over semester two and semester four for all types of copy
with the exception of invoices. Students at all three levels
spent more time setting up tables and reports than any other
type of copy.

Differences in Decision-Making Errors

Table XLIII shows the differences in decision-making
errors on six types of copy at level one (second semester
of instruction).

TABLE XLIII

COMPARISON OF DECISION-MAKING ERRORS ON
SIX TYPES OF COPY AT LEVEL ONE

Comparison of Copy	F Ratio
Letter, table	3.59*
Letter, report	0.93
Letter, memorandum	0.25
Letter, invoice	0.86
Letter, manuscript	0.15
Table, report	0.86
Table, memorandum	1.94
Table, invoice	7.96*
Table, manuscript	5.20*
Report, memorandum	0.22
Report, invoice	3.59*
Report, manuscript	1.83
Memorandum, invoice	2.05
Memorandum, manuscript	0.79
Invoice, manuscript	0.29

*Significant at .01 and .05 levels.

The only significant differences in decision-making errors at the second semester of instruction were between letters and tables, tables and invoices, tables and manuscripts, and reports and invoices.

Table XLIV shows the mean decision-making errors for the different types of copy for the second semester of instruction.

TABLE XLIV

MEAN DECISION-MAKING ERRORS AT LEVEL ONE

Type of Copy	Total Mean Decision-Making Errors	Standard Deviation
Table	.08	1.14
Report	1.14	1.39
Memorandum	1.29	1.25
Letter	1.46	1.14
Manuscript	1.59	1.30
Invoice	1.77	1.65

For second-semester students, the fewest number of decision-making errors was made on tables, and the greatest number of decision-making errors was made on invoices. However, the range for all decision-making errors was small-- .08 to 1.77.

Table XLV shows the differences in decision-making errors on six types of copy at level two (fourth semester of instruction).

TABLE XLV

COMPARISON OF DECISION-MAKING ERRORS ON
SIX TYPES OF COPY AT LEVEL TWO

Comparison of Copy	F Ratio
Letter, table	2.65**
Letter, report	1.66
Letter, memorandum	2.90*
Letter, invoice	2.41*
Letter, manuscript	0.21
Table, report	0.12
Table, memorandum	0.00
Table, invoice	10.12*
Table, manuscript	4.34
Report, memorandum	0.17
Report, invoice	8.07*
Report, manuscript	3.03**
Memorandum, invoice	10.61*
Memorandum, manuscript	4.66*
Invoice, manuscript	1.21

*Significant at .01 and .05 levels.

**Significant at .05 level only.

No significant differences in decision-making errors were revealed between letters and reports, invoices and manuscripts, letters and manuscripts, and among tables, reports, and memorandums.

Table XLVI shows the mean decision-making errors for the different types of copy for the fourth semester of instruction.

TABLE XLVI

MEAN DECISION MAKING ERRORS AT LEVEL TWO

Type of Copy	Total Mean Decision- Making Errors	Standard Deviation
Memorandum	0.27	0.62
Table	0.30	0.72
Report	0.44	0.68
Letter	0.95	0.92
Manuscript	1.14	1.19
Invoice	1.58	1.65

The decision-making errors were less on all types of copy with the exception of tables for the fourth semester student than for the second semester student.

Table XLVII shows the differences in decision-making errors on six types of copy at level three (more than four semesters of instruction).

TABLE XLVII

COMPARISON OF DECISION-MAKING ERRORS ON
SIX TYPES OF COPY AT LEVEL THREE

Comparison of Copy	F Ratio
Letter, table	0.95
Letter, report	1.54
Letter, memorandum	2.83
Letter, invoice	1.54
Letter, manuscript	0.28
Table, report	0.07
Table, memorandum	0.50
Table, invoice	0.07
Table, manuscript	0.20
Report, memorandum	0.20
Report, invoice	0.00
Report, manuscript	0.50
Memorandum, invoice	0.20
Memorandum, manuscript	1.32
Invoice, manuscript	0.50

As can be seen from this table, there were no significant differences in decision-making errors on any combinations of copy for more than four semesters of instruction.

Table XLVIII shows the mean decision-making errors for the different types of copy for more than four semesters of instruction.

TABLE XLVIII

MEAN DECISION-MAKING ERRORS AT LEVEL THREE

Type of Copy	Total Mean Decision- Making Errors	Standard Deviation
Memorandum	0.20	0.41
Invoice	0.53	0.52
Report	0.53	0.52
Table	0.73	0.88
Manuscript	1.07	0.96
Letter	1.47	1.64

The order of decision-making errors was not the same from semester four to more than four semesters of instruction, but the range was approximately the same. For the fourth semester of instruction, the range was from .27 to 1.58, and for more than four semesters of instruction, the range was from .20 to 1.47.

The four difficulty factors (keystroking speed, keystroking errors, decision-making speed, and decision-making errors) that have been presented separately in Tables XIX through XLVIII are combined in Table XLIX to show the relationship between these difficilty factors at the three levels of instruction. The copy is arranged from the easiest to the most difficult on each factor.

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TABLE XLIX

COPY ARRANGED ACCORDING TO DIFFICULTY FACTORS BY LEVEL OF INSTRUCTION*

Level	Keystroking Speed	Keystroking Errors	Decision-Making Speed	Decision-Making Errors
Two Semesters	Report Memorandum Letter** Manuscript Table Invoice	Table** Invoice Letter Manuscript** Memorandum Report	Letter** Memorandum Manuscript Invoice Report Table	Table** Report** Memorandum** Letter Manuscript Invoice
Four Semesters	Report Memorandum** Letter Manuscript Table** Invoice	Invoice** Table Letter Memorandum** Report Manuscript	Manuscript** Letter Memorandum Invoice Report** Table	Memorandum** Table Report** Letter** Manuscript Invoice
More than Four Semesters	Report** Letter Memorandum Manuscript Invoice** Table	Table ** Invoice Letter Report Memorandum Manuscript	Invoice ** Manuscript Letter** Memorandum Table Report	Memorandum** Invoice Report Table Manuscript Letter

*For keystroking speed and decision-making speed, copy is arranged from the fastest speed to the slowest speed. For keystroking errors and decision-making errors, copy is arranged from the least number of errors to the most number of errors.

**No significant difference.

The order of the copy as to keystroking speed did not change from semester two to semester four, and there was only a slight change in order from semester four to more than four semesters. The students at all levels were faster on keystroking speed on reports than on any other type of copy and were slower in keystroking speed on invoices and tables than on any other type of copy. Students at all levels made the least number of keystroking errors on invoices and tables and the most number of keystroking errors on memorandums, manuscripts, and reports. There were few consistencies in decision-making speed from level to level. However, students at all levels were slowest in decision-making speed on tables and reports. The fewest number of decision-making errors was made at the second and fourth semester on tables, reports and memorandums. The highest number of decision-making errors was made on letters, manuscripts, and invoices. For more than four semesters of instruction, the number of decision-making errors was approximately the same with the exception of tables and invoices--more errors were made on tables than on invoices.

Differences in Typewritten and Longhand Copy

Keystroking Speed

Table L shows the mean gross words per minute rate on all types of tasks for typewritten copy and longhand copy.

TABLE L

MEAN GROSS WORDS PER MINUTE RATE FOR ALL TASKS
ON TYPEWRITTEN COPY AND LONGHAND COPY

Level	Type of Copy	GWPM on Typewritten Copy	GWPM on Longhand Copy
Second Semester	Table	16.18	12.91
	Invoice	16.88	13.17
	Report	26.23	24.08
	Manuscript	27.59	25.59
	Letter	29.74	29.44
	Memorandum	32.09	26.03
Fourth Semester	Invoice	20.39	19.79
	Table	24.77	15.09
	Manuscript	36.18	32.89
	Report	37.89	34.67
	Letter	38.88	37.55
	Memorandum	44.82	41.68
More than Four Semesters	Table	14.53	12.40
	Invoice	19.27	16.40
	Manuscript	23.47	22.53
	Memorandum	24.40	24.07
	Report	24.67	21.73
	Letter	26.67	24.93

On all types of copy at all levels, students consistently typed at a lower gross rate per minute on longhand copy than on typewritten copy. However, the word per minute difference was small. The largest difference was in tables at the fourth semester where longhand tables were typed 9.68 gross words per minute slower than typewritten tables. For the major portion of the copy there was approximately a one to three gross word per minute difference.

Table LI points out that this difference was not significant except at two points.

TABLE LI

DIFFERENCE IN KEYSTROKING SPEED BETWEEN
LONGHAND AND TYPEWRITTEN COPY

Level	Type of Copy	Difference in Keystroking speed
Second Semester	Letter	0.02
	Table	1.83
	Report	0.79
	Memorandum	6.32*
	Invoice	2.36
	Manuscript	0.68
Fourth Semester	Letter	0.15
	Table	7.82*
	Report	0.87
	Memorandum	0.82
	Invoice	0.83
	Manuscript	0.90
More than Four Semesters	Letter	0.04
	Table	0.05
	Report	0.10
	Memorandum	0.00
	Invoice	0.10
	Manuscript	0.01

*Significant at .01 and .05 levels.

The two significant differences in keystroking speed between longhand and typewritten copy were on memorandums at the second semester of instruction and on tables at the fourth semester of instruction. There were no significant differences on any type of copy for the more than four semester

student. Therefore, although the student consistently typed at a lower gross rate per minute on longhand copy as compared to typewritten copy, this difference was not great enough to be significant.

Keystroking Errors

Table LII shows the mean number of keystroking errors made on all types of tasks for typewritten copy and longhand copy.

TABLE LII

MEAN KEYSTROKING ERRORS FOR ALL TYPES OF TASKS
ON TYPEWRITTEN COPY AND LONGHAND COPY

Level	Type of Copy	Mean Errors Typewritten	Mean Errors Longhand
Second Semester	Table	4.76	6.50
	Invoice	4.84	7.82
	Manuscript	9.78	12.61
	Letter	10.33	9.52
	Report	11.23	14.58
	Memorandum	12.76	10.47
Fourth Semester	Invoice	3.24	4.91
	Table	3.33	2.14
	Letter	5.85	5.86
	Report	6.89	8.34
	Manuscript	7.98	9.77
	Memorandum	8.00	9.14
More than Four Semesters	Table	1.13	1.20
	Invoice	2.13	2.80
	Manuscript	2.27	4.52
	Letter	3.87	5.60
	Report	4.53	4.13
	Memorandum	4.67	5.33

As can be seen from the table, with a few exceptions (letters and memorandums at the second semester, tables at the fourth semester, and reports at more than four semesters), students at all levels made more errors on longhand copy than they did on typewritten copy. However, the difference in error was small. Table LIII shows that the difference is not statistically significant.

TABLE LIII

DIFFERENCE IN KEYSTROKING ERRORS BETWEEN
LONGHAND AND TYPEWRITTEN COPY

Level	Type of Copy	Difference in Keystroking Errors Between Longhand and Typewritten Copy
Second Semester	Letter	0.11
	Table	0.53
	Report	1.96
	Memorandum	0.92
	Invoice	1.55
	Manuscript	1.40
Fourth Semester	Letter	0.00
	Table	0.18
	Report	0.27
	Memorandum	0.16
	Invoice	0.35
	Manuscript	0.41
More than four semesters	Letter	0.12
	Table	0.00
	Report	0.01
	Memorandum	0.02
	Invoice	0.02
	Manuscript	0.21

At no point is there a significant difference in key-
stroking errors between typewritten copy and longhand copy.

Mean Speed and Errors

Work condition five combined all production activities--
keystroking, decision-making, typing from longhand copy,
erasing on an original, making one carbon copy, and proof-
reading. Therefore, work condition five is presented here
since it contained the most significant mean speed for setting
standards. Table LIV shows the mean gross words per minute
rate on all types of copy for all levels of instruction.

TABLE LIV

MEAN SPEED ON ALL TYPES OF COPY FOR ALL LEVELS

Level	Type of Copy	Mean Gross Words Per Minute	Standard Deviation
Second Semester	Table	7.95	1.98
	Invoice	9.75	2.88
	Manuscript	13.78	3.86
	Report	14.80	3.85
	Letter	15.08	5.16
	Memorandum	16.55	4.30
Fourth Semester	Table	13.23	2.46
	Invoice	13.56	2.55
	Manuscript	18.98	4.20
	Report	24.55	4.73
	Memorandum	25.73	6.73
	Letter	25.92	6.42
More than Four Semesters	Invoice	11.13	3.52
	Table	11.27	4.28
	Manuscript	16.07	3.77
	Report	17.07	4.89
	Letter	19.47	4.81
	Memorandum	21.13	3.83

The table shows that the more than four semester stu-
dents were consistently lower in speed than the fourth-
semester students. However, the fourth-semester student was
consistently faster in gross speed than the second-semester
student. Table LV shows the per cent of gain in gross words
per minute.

TABLE LV

PER CENT OF GAIN IN GROSS WORDS PER MINUTE
FROM SEMESTER TWO TO SEMESTER FOUR

Level	Increase in Per Cent
Manuscript	37.34
Invoice	39.08
Memorandum	55.47
Report	65.88
Table	66.42
Letter	71.88

Table LVI shows the mean number of errors (keystroking
and decision-making combined) that were made. Under this
work condition, the students were to have erased their
errors and to have proofread the copy. These errors, then,
are the ones not discovered by the students in the proof-
reading process.

TABLE LVI

MEAN KEYSTROKING AND DECISION-MAKING ERRORS
ON ALL TYPES OF COPY FOR ALL LEVELS

Level	Type of Copy	Keystroking and Decision-Making Errors Combined
Second Semester	Letter	1.85
	Report	2.35
	Invoice	2.51
	Manuscript	3.05
	Table	3.50
	Memorandum	4.17
Fourth Semester	Memorandum	0.94
	Invoice	1.45
	Letter	1.53
	Report	2.06
	Table	2.15
	Manuscript	3.38
More than Four Semesters	Invoice	1.40
	Memorandum	2.00
	Table	2.07
	Report	2.13
	Letter	2.13
	Manuscript	4.47

Students at all levels had from one to four undetected errors.

CHAPTER V

DEVELOPMENT OF A TEACHING MODEL AND STANDARDS

Teaching Model

A principle of learning theory is that tasks should progress from the least difficult to the most difficult. Early success is important for the student in a learning situation. Thus, a knowledge of the difficulty order of production tasks is of importance to the typewriting teacher.

In order to determine the difficulty of the six production tasks used in this study, two speed difficulty factors (keystroking speed and decision-making speed) and two accuracy difficulty factors (keystroking errors and decision-making errors) were considered. In relation to speed, the tasks in which the students performed at the highest keystroking and decision-making speed were considered the least difficult, and the tasks in which the student performed at the lowest keystroking and decision-making speed were considered the most difficult. In relation to accuracy, the tasks in which the students made the fewest number of keystroking and decision-making errors were considered the least difficult, and the tasks in which the students made the highest number of keystroking and decision-making errors were considered the most difficult. Table XLIX on page 131 itemizes these

difficulty factors in the order of difficulty for each level of instruction. Brackets are used in the table to indicate no statistically significant differences in copy although slight differences in speed or error scores were present.

The difficulty factor that was considered the most important in setting up the teaching model was keystroking speed due to the few numbers of non-significant differences in copy for this factor and to the large percentage of time that the student was involved in keystroking activities. Table XL reveals that there were fewer non-significant differences in keystroking speed than in any other difficulty factor. For the student with two semesters of instruction, the differences in keystroking speed were significant on all types of copy with the exception of letters and manuscripts. On all other difficulty factors, there were more non-significant differences. For the student with four semesters of instruction, there were significant differences in all types of copy on keystroking speed with the exception of memorandums and letters and tables and invoices. For more than four semesters of instruction, there were fewer non-significant differences in keystroking speed than at any other level. The table reveals that there were no significant differences in copy among reports, letters, memorandums, and manuscripts and between invoices and tables. However, there were still fewer non-significant differences in keystroking speed for the more
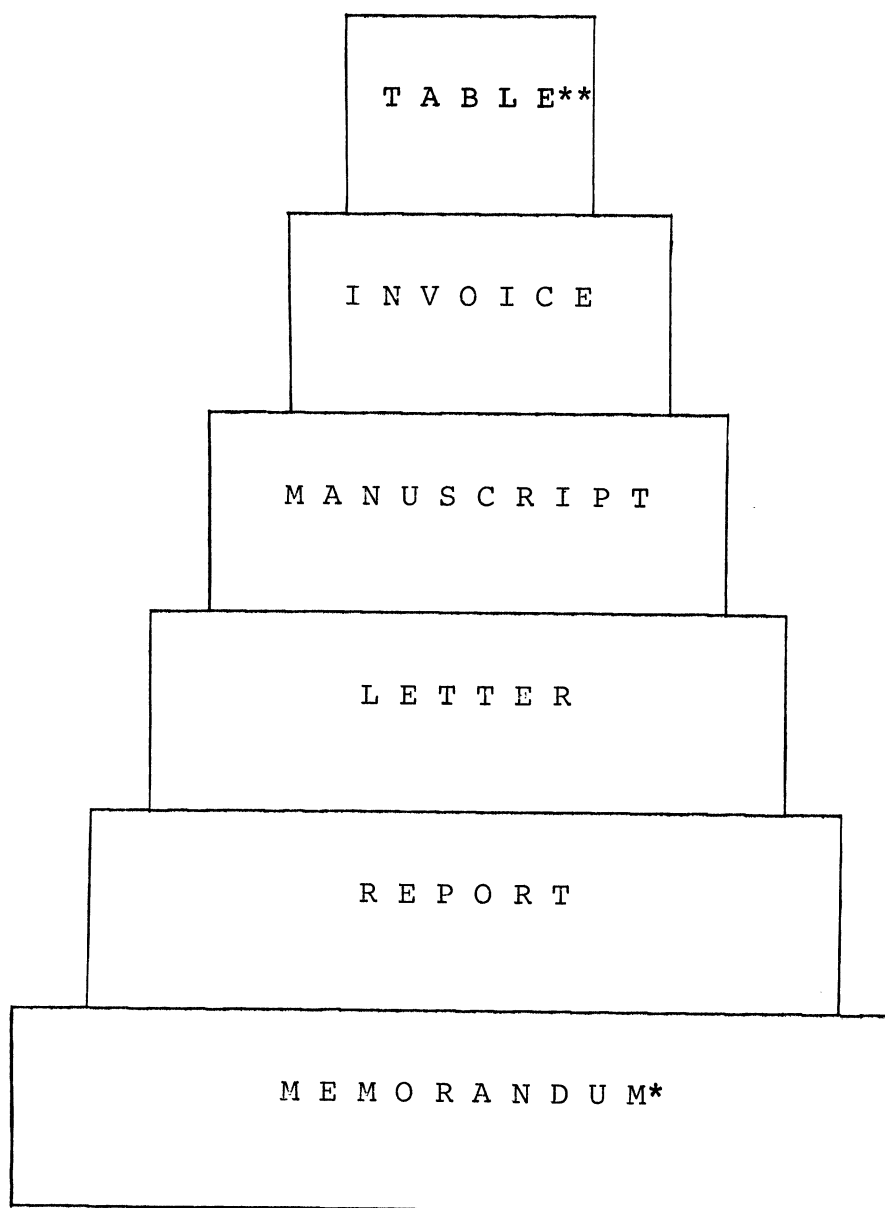
*Least difficult.

**Most difficult.

Fig. 2--Teaching model for six production tasks for all levels of instruction.

than four-semester student than for any other difficulty factor.

Also considered was the time involved in the keystroking activity. Table XVI on page 96 shows that students at all levels of instruction spent more time in keystroking than in any other production activity. Forty-eight per cent of the time was spent in keystroking at the second semester, 53.37 per cent at the fourth semester, and 50.09 per cent at more than four semesters.

Although keystroking speed was considered the most important in setting up the model, the other difficulty factors were also considered. Memorandums and letters were in the top three least difficult on three factors; manuscripts were in the bottom three most difficult on three factors; reports were in the top three least difficult on two factors; invoices and tables were in the bottom three most difficult on two factors.

Figure 2 presents the teaching model for the six production tasks for all levels of instruction. The teaching model is the same for all levels since the difficulty factors proved to be quite similar at each level. The first production job to be taught should be memorandums, followed by rough-draft reports, letters, manuscripts, invoices, and tables in that order. Teaching suggestions are presented following the model.

Model for Second and Fourth Semester

Memorandums should be taught first followed by reports with proofreader's marks. Since reports proved to be difficult for the student to type as to length of time involved in decision-making, it is suggested that proofreader's marks be taught thoroughly before beginning the unit on reports. It is suggested that accuracy be stressed while teaching memorandoms,reports, letters, and manuscripts since students made more errors on alphabetic copy than numeric copy.

Although letters were typed slightly faster than manuscripts at the second semester of instruction (31.81 compared to 30.16), there was no significant difference in keystroking speed between these two types of copy. There were also no significant differences in decision-making speed and decision-making errors between letters and manuscripts at the second semester. Therefore, although the model presents letters before manuscripts, the order of presentation is not significant for the second-semester student. The teacher may choose to present letters before manuscripts or manuscripts before letters. However, the student at the fourth semester of instruction typed letters significantly faster than manuscripts. At the fourth-semester level, it is suggested that letters be taught before manuscripts.

Invoices and tables should be taught last for both second and fourth-semester students. Since students typed

numeric copy considerably slower than alphabetic copy, it is suggested that speed drills be given on numbers before invoices and tables are taught in an effort to increase the speed of the student on numeric copy. Also, since more time was consumed in decision-making on tables than on any other type of copy, it is suggested that speed drills be given on table set-up to encourage faster decision-making.

Model for More Than Four Semesters

The teaching model for students with more than four semesters should be the same as the model for the second and fourth-semester students. However, at this level, there were no significant differences in keystroking speed among memorandums, reports, letters, and manuscripts. The student typed these types of copy with approximately the same keystroking speed. Therefore, the teacher might want to combine these tasks into a simulated unit for the advanced student.

Accuracy does not need to be stressed as heavily on alphabetic copy at this level since fewer errors were made on alphabetic copy than at any other level. Invoices and tables should be taught last as in the second and fourth semesters. Speed drills on numeric copy should be continued.

The teaching model presented here shows a progression of tasks from the least difficult to the most difficult. Such a model applies the fundamental principle that learning should proceed from the simple to the complex. This principle allows

the student to experience success at each level and not feel
the frustration of trying to perform at a job that is too
complex for his skill development at that point.

Standards

Speed Standards

The mean speeds and standard deviations for all six
types of production copy at all levels of instruction were
reported in Table LIV on page 137. With a knowledge of the
mean speeds and standard deviations, standards have been es-
tablished for the three levels of instruction.

It can be assumed that typewriting speeds are normally
distributed. The normal distribution can be broken into
stanines. Stanine five includes the arithmetic mean and
scores which fall one-fourth standard deviation above and
below the mean. Stanines six, seven, and eight include
scores which fall one-half standard deviation successively
above stanine five. Stanine nine includes the scores remain-
ing above stanine eight. Stanines two, three, and four
include scores one-half standard deviation successively
below stanine five. Stanine one covers the remaining scores
below stanine two. Hardaway converts stanines to letter
grades as shown in Table LVII.[1]

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[1]Hardaway, Mathilde, Testing and Evaluation in Business
Education (Cincinnati, 1966), p. 413.

TABLE LVII

CONVERSION OF STANINES TO LETTER GRADES

Stanine	Letter Grade
Stanine 1	F
Stanine 2	D-
Stanine 3	D
Stanine 4	C-
Stanine 5	C
Stanine 6	B-
Stanine 7	B
Stanine 8	A-
Stanine 9	A

Using the mean speeds and standard deviations for all
levels of instruction, stanines were computed and then con-
verted to letter grades.

The conditions under which these standards were estab-
lished were:

1. Students were timed while completing all activities--
planning, typing, erasing, correcting, and proofreading.

2. Students were timed for the entire class period on
production jobs with the exception of time involved in warm-
up activities and roll-checking. The students were timed for
approximately thirty to forty minutes.

3. The copy was handwritten.

4. One carbon copy was prepared for all types of tasks.

5. Erasing was the only correction procedure allowed.

6. Copy was controlled as to difficulty with all copy being average to high average on syllable intensity, average word length, high-frequency words, and length.

7. All letters were typed in modified block style. There were no special features such as attention lines in the letters.

8. The manuscripts were unbound in format with two footnotes per manuscript.

9. The tables were open style with four columns--one alphabetic column and three numeric columns.

10. All students used electric typewriters.

11. All students were on the traditional two-semester school year.

12. The copy was typed during the last of April; therefore, students were close to maximum skill development for the year.

13. Speed and accuracy were figured separately with gross words per minute being figured and total keystroking errors and decision-making errors being computed.

The suggested speed standards for each level of instruction are presented in Tables LVIII through LX on the following pages.

TABLE LVIII

SUGGESTED SPEED STANDARDS IN GROSS WORDS PER
MINUTE FOR SECOND-SEMESTER STUDENTS

Type of Copy	Gross Words Per Minute	Letter Grade
Table	11 and above	A
	9 - 10	B
	6 - 8	C
	4 - 5	D
	3 and below	F
Invoice	14 and above	A
	11 - 13	B
	8 - 10	C
	5 - 7	D
	4 and below	F
Manuscript	20 and above	A
	16 - 19	B
	11 - 15	C
	7 - 10	D
	6 and below	F
Report	21 and above	A
	17 - 20	B
	12 - 16	C
	8 - 11	D
	7 and below	F
Letter	23 and above	A
	17 - 22	B
	11 - 16	C
	6 - 10	D
	5 and below	F
Memorandum	23 and above	A
	19 - 22	B
	13 - 18	C
	9 - 12	D
	8 and below	F

TABLE LIX

SUGGESTED SPEED STANDARDS IN GROSS WORDS PER
MINUTE FOR FOURTH-SEMESTER STUDENTS

Type of Copy	Gross Words Per Minute	Letter Grade
Table	17 and above 15 - 16 11 - 14 9 - 10 8 and below	A B C D F
Invoice	18 and above 15 - 17 11 - 14 8 - 10 7 and below	A B C D F
Manuscript	25 and above 21 - 24 16 - 20 12 - 15 11 and below	A B C D F
Report	31 and above 27 - 30 21 - 26 17 - 20 16 and below	A B C D F
Letter	35 and above 29 - 34 21 - 28 15 - 20 14 and below	A B C D F
Memorandum	36 and above 29 - 35 21- 28 14- 20 13 and below	A B C D F

TABLE LX

SUGGESTED SPEED STANDARDS IN GROSS WORDS PER MINUTE
FOR MORE THAN FOUR-SEMESTER STUDENTS*

Type of Copy	Gross Words Per Minute	Letter Grade
Table	18 and above	A
	14 - 17	B
	8 - 13	C
	4 - 7	D
	3 and below	F
Invoice	17 and above	A
	13 - 16	B
	8 - 12	C
	5 - 7	D
	4 and below	F
Manuscript	22 and above	A
	18 - 21	B
	13 - 17	C
	9 - 12	D
	8 and below	F
Report	23 and above	A
	19 - 22	B
	13 - 18	C
	9 - 12	D
	8 and below	F
Letter	26 and above	A
	22 - 25	B
	16 - 21	C
	11 - 15	D
	10 and below	F
Memorandum	27 and above	A
	23 - 26	B
	18 - 22	C
	14 - 17	D
	13 and below	F

*This sample is considered atypical; the composition of
the sample is explained on the following page.

There are several problems with the suggested standards for the more than four-semester student. When the study was planned, two classes on the community college level were to be used. However, it proved impossible to find full-time day classes with an adequate number of students that had had more than four semesters of instruction. One class of night students enrolled in a community college typewriting course was selected. The class had thirty-one students enrolled; however, due to absences, usable scores were obtained from only fifteen students. The class was composed of people with quite different backgrounds. Some of the students were beginning college after being out of school for a number of years. Although they had had more than four semesters of typewriting, their instruction was from five to ten years previously. Most of the students were employed during the day--some as typists, with a minimum of one year's experience and a maximum of ten years' experience. The class also consisted of two veterans, both of whom had typed in the service. The age range was from nineteen years to thirty-eight years. The class met only two nights a week. Due to the wide range of differences in this class, the class is not considered typical of the average class of students with more than four semesters of instruction. Thus, the standards established here may be generalized only to a population that has the unique characteristics of this limited sample.

Accuracy Standards

Table XLVI on page 128 shows the number of undetected keystroking and decision-making errors combined that students at all levels of instruction made on all types of copy. By taking the average number of errors made on each type of copy and dividing by the time it took the students to type the copy, the average number of errors made per minute on each type of copy was discovered. Table LXI shows the number of errors for each level.

TABLE LXI

AVERAGE NUMBER OF UNDETECTED ERRORS MADE PER MINUTE
FOR EACH LEVEL ON EACH TYPE OF COPY

Level	Type of Copy	Number of Errors Per Minute
Second Semester	Letter	.16
	Table	.18
	Report	.15
	Memorandum	.29
	Invoice	.15
	Manuscript	.18
Fourth Semester	Letter	.24
	Table	.18
	Report	.22
	Memorandum	.11
	Invoice	.17
	Manuscript	.26
More than Four Semesters	Letter	.26
	Table	.13
	Report	.21
	Memorandum	.29
	Invoice	.10
	Manuscript	.31

By averaging across all types of copy, the average
number of undetected errors made per minute for each level
was discovered. Table LXII shows these errors.

TABLE LXII

AVERAGE NUMBER OF UNDETECTED ERRORS MADE ACROSS
ALL TYPES OF COPY FOR EACH LEVEL

Level	Number of Errors Per Minute
Second semester	.19
Fourth semester	.20
More than four semesters	.22

As can be seen from this table, the average number of
undetected errors made per minute across all types of copy is
almost the same at all levels of instruction. Using these
figures then, it can be seen that an average of .20 unde-
tected errors are made each minute. Production timings
generally involve thirty minute timings. In thirty minutes,
the average student would make six errors based on .20 errors
per minute. It is suggested that the error penalty be four
points per error for a thirty minute production timing; this
penalty would give the average student a grade of seventy-six
or a "C" grade. Table LXIII presents an error penalty scale.

In 1942, Jurgensen designed an employment test in which
he discovered that the most valid method of measuring pro-
duction work was to give equal weight to speed and quality

TABLE LXIII

ERROR PENALTY SCALE FOR THIRTY MINUTE TIMINGS
FOR ALL LEVELS OF INSTRUCTION

Number of Errors   Grade

Number of Errors	Grade
1	96
2	92
3	88
4	84
5	80
6	76
7	72
8	68
9	64
10	60
11	56
12	52
13	48
14	44
15	40
16	36
17	32
18	28
19	24
20	20
21	16
22	12
23	8
24	4

in production.[2] Based on Jurgensen's finding, it is suggested that the speed grade and the accuracy grade be averaged together giving equal weight to each grade to arrive at a single performance grade.

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[2]C. E. Jurgensen, "A Test for Selecting and Training Industrial Typists," Educational and Psychological Measurement, II (October, 1942), 409-425.

CHAPTER VI

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purposes of this study were: (1) to identify the
percentage of time spent in keystroking, decision making,
typing from longhand copy, erasing an original, typing and
correcting one carbon copy, and proofreading on six produc-
tion typewriting tasks; (2) to test the correlation between
anxiety level and decision-making time, self concept and
decision-making time, and IQ and decision-making time; (3) to
analyze the differences in difficulty level of six production
tasks and to develop a teaching model for these tasks; and
(4) to discover the mean gross words per minute speed and
total number of errors on six production tasks and to develop
production standards for these tasks.

The sample consisted of a total of 234 students from
four high schools and one community college in a large metro-
politan area. Six teachers were involved in the study. Of
the 234 students, 153 students were in the second semester
of typewriting in high school, 66 students were in the fourth
semester of high school typewriting, and 15 students were
enrolled in an advanced typewriting class in a community
college and had had more than four semesters of typewriting.

The students were tested on six types of copy (letters, tables, rough-draft reports, memorandums, manuscripts, and invoices) under the following five work conditions: (1) arranged typewritten copy, (2) unarranged typewritten copy, (3) unarranged longhand copy, (4) unarranged longhand copy with erasing, and (5) unarranged longhand copy with erasing, typing and correcting one carbon copy, and proofreading.

Five work conditions were used in order to arrive at the percentage of time spent in keystroking, decision-making, typing longhand copy, erasing an original, and typing and correcting a carbon copy and proofreading. Work condition one involved typing from totally arranged typewritten copy. The students were not timed while they made the machine adjustments. From this work condition, the time involved in keystroking was determined. Work condition two involved typing from unarranged typewritten copy; the students were timed while they made their machine adjustments. From this work condition, decision-making time was determined. Work condition three involved typing from unarranged longhand copy; therefore, the time spent in typing longhand copy was determined. From work condition four, the time involved in erasing an original was determined. From work condition five, the time involved in making a carbon, erasing and correcting the carbon, and proofreading was determined.

In addition to the production typewriting testing, the students were given the IPAT Anxiety Scale, the Tennessee Self Concept Scale, and the Otis Lennon Mental Ability Test. The scores on these tests were correlated with the time involved in decision making to determine if any three of these factors contributed to speed in decision-making.

An analysis was made on each of the six production tasks to determine the difficulty of the tasks on four factors-- keystroking speed, keystroking errors, decision-making speed, and decision-making errors. From these difficulty factors, a model was established to show the order in which the six production tasks should be taught.

The mean gross words per minute and the total number of errors were computed on each production task at each level of instruction. From these data, speed and accuracy standards were established for all levels of instruction.

Three-way analyses of variance were run on the three levels of instruction, the five work conditions, and the six types of copy to determine if there were significant differences in keystroking speed, keystroking errors, and decision-making errors. One-way analyses of variance were run at each of the three levels on copy to determine if there were significant differences in keystroking speed, keystroking errors, decision-making speed, and decision-making errors. Multiple comparison tests were then run between types of copy. Two-way

analyses of variance were run to determine if there were significant differences between: (1) keystroking speed on longhand copy and keystroking speed on typewritten copy and (2) keystroking errors on longhand copy and keystroking errors on typewritten copy. An F ratio was used to determine significance on all the analyses.

Pearson product-moment correlations were run between decision-making speed and scores on the IPAT Anxiety Scale, the Tennessee Self Concept Scale, and the Otis-Lennon Mental Ability Scale. Percentages of time involved in the production typewriting activities were computed by taking the time involved under each work condition. The mean gross words per minute rate and the total number of undetected errors were computed under work condition five so that standards could be established.

For purposes of clarification, the major findings of this study have been categorized according to instructional level.

Findings for Semester Two

1. The following percentages of time were spent in each production activity:

Keystroking	48.00 per cent
Decision-making	8.79 per cent
Typing from longhand	8.01 per cent
Erasing an original	11.48 per cent
Typing a carbon, erasing the carbon, and proofreading	23.72 per cent

2. Keystroking consumed 50.49 per cent of the student's time on all types of copy with the exception of tables. Keystroking on tables consumed 35.58 per cent of the student's time.

3. Erasing an original, typing a carbon, erasing the carbon, and proofreading consumed 35.20 per cent of the student's time.

4. The greatest amount of time in decision-making was spent on tables (20.65 per cent) and the least amount of time in keystroking was spent on tables (35.58 per cent).

5. Less time was spent erasing an original on tables than on any other type of copy.

6. There was a significant correlation between the Otis-Lennon Mental Ability Scale and decision-making time.

7. There was not a significant correlation between the IPAT Anxiety Scale and decision-making time.

8. There was not a significant correlation between the Tennessee Self Concept Scale and decision-making time.

9. Alphabetic copy was typed from ten to twenty-six gross words per minute faster than numeric copy.

10. There was a significant difference in keystroking speed among all types of copy with the exception of letters and manuscripts.

11. From six to eight keystroking errors were made on letters, tables, and invoices, and from fourteen to sixteen

keystroking errors were made on reports, memorandums, and manuscripts.

12. Keystroking errors for all types of copy ranged from 6.10 to 15.53.

13. The time involved in decision-making was approximately the same for the second-semester student and the fourth-semester student.

14. The range of decision-making errors was from .08 to 1.77.

15. The difficulty order (from least difficult to most difficult) of the six types of production copy on keystroking speed was:

> Report
> Memorandum
> Letter
> Manuscript
> Table
> Invoice

16. The difficulty order (from least difficult to most difficult) of the six types of production copy on keystroking errors was:

> Table
> Invoice
> Letter
> Manuscript
> Memorandum
> Report

17. The difficulty order (from least difficult to most difficult) of the six types of production copy on decision-making speed was:

       Letter
       Memorandum
       Manuscript
       Invoice
       Report
       Table

18. The difficulty order (from least difficult to most difficult) of the six types of production copy on decision-making errors was:

       Table
       Report
       Memorandum
       Letter
       Manuscript
       Invoice

19. The mean gross words per minute for the six types of production copy was:

Table	7.95
Invoice	9.75
Manuscript	13.78
Report	14.80
Letter	15.08
Memorandum	16.55

20. The highest percentage gain in gross words per minute from the second semester to the fourth semester was on letters followed by tables, reports, memorandums, invoices, and manuscripts.

Findings for Semester Four

1. The following percentages of time were spent in each production activity:

Keystroking	53.37 per cent
Decision-making	9.08 per cent
Typing from longhand	11.64 per cent
Erasing an original	10.26 per cent
Typing a carbon, erasing the carbon, and proofreading	15.65 per cent

2. Keystroking consumed 56.30 per cent of the student's time on all types of copy with the exception of tables. Keystroking on tables consumed 38.74 per cent of the student's time.

3. Erasing an original, typing a carbon, erasing the carbon, and proofreading consumed 25.91 per cent of the student's time.

4. The greatest amount of time in decision-making was spent on tables (19.18 per cent), and the least amount of time in keystroking was spent on tables (38.74 per cent).

5. There was not a significant correlation between the Otis-Lennon Mental Ability Scale and decision-making time.

6. There was not a significant correlation between the Tennessee Self Concept Scale and decision-making time.

7. There was not a significant correlation between the IPAT Anxiety Scale and decision-making time.

8. No significant differences were found in keystroking speed between letters and memorandums and tables and invoices. A significant difference was found between all other combinations of copy.

9. Alphabetic copy was typed from twelve to twenty-nine gross words per minute faster than numeric copy.

10. From three to four keystroking errors were made on invoices, tables, and letters, and from seven to eight keystroking errors were made on memorandums, reports, and manuscripts.

11. Keystroking errors for all types of copy ranged from 3.45 to 8.16.

12. Less time was spent erasing an original on tables than on any other type of copy.

13. The range of decision-making errors was from .27 to 1.58.

14. The difficulty order (from least difficult to most difficult) of the six types of production copy on keystroking speed was:

> Report
> Memorandum
> Letter
> Manuscript
> Table
> Invoice

15. The difficulty order (from least difficult to most difficult) of the six types of production copy on keystroking errors was:

> Invoice
> Table
> Letter
> Memorandum
> Report
> Manuscript

16. The difficulty order (from least difficult to most difficult) of the six types of production copy on decision-making speed was:

Manuscript
Letter
Memorandum
Invoice
Report
Table

17. The difficulty order (from least difficult to most difficult) of the six types of production copy on decision-making errors was:

Memorandum
Table
Report
Letter
Manuscript
Invoice

18. The mean gross words per minute for the six types of production copy was:

Table	13.23
Invoice	13.56
Manuscript	18.98
Report	24.55
Memorandum	25.73
Letter	25.92

Findings for More Than Four Semesters

1. The following percentages of time were spent in each production activity:

Keystroking	50.09 per cent
Decision-making	24.10 per cent
Typing from longhand	3.66 per cent
Erasing an original	9.02 per cent
Typing a carbon, erasing the carbon, and proofreading	13.13 per cent

2. Keystroking consumed 53.05 per cent of the student's time on all types of copy with the exception of tables. Keystroking on tables consumed 35.30 per cent of the student's time.

3. Erasing an original, typing a carbon, erasing the carbon, and proofreading consumed 22.15 per cent of the student's time.

4. The greatest amount of time in decision-making was spent on reports (38.46 per cent), followed by tables (30.00 per cent), and the least amount of time in keystroking was spent on tables (35.30 per cent).

5. There was a significant correlation between the Otis-Lennon Mental Ability Scale and decision-making time.

6. There was not a significant correlation between the IPAT Anxiety Scale and decision-making time.

7. There was not a significant correlation between the Tennessee Self Concept Scale and decision-making time.

8. There were no significant differences in keystroking speed among letters, reports, memorandums, and manuscripts and between tables and invoices.

9. Alphabetic copy was typed from twelve to twenty gross words per minute faster than numeric copy.

10. From three to six keystroking errors were made on all types of copy.

11. The time involved in decision-making was greater for the student with more than four semesters than for the student with two or four semesters.

12. The range of decision-making errors was from .20 to 1.47.

13. The difficulty order (from least difficult to most difficult) of the six types of production copy on keystroking speed was:

> Report
> Letter
> Memorandum
> Manuscript
> Invoice
> Table

14. The difficulty order (from least difficult to most difficult) of the six types of production copy on keystroking errors was:

> Table
> Invoice
> Letter
> Report
> Memorandum
> Manuscript

15. The difficulty order (from least difficult to most difficult) of the six types of production copy on decision-making speed was:

> Invoice
> Manuscript
> Letter
> Memorandum
> Table
> Report

16. The difficulty order (from least difficult to most difficult) of the six types of production copy on decision-making errors was:

> Memorandum
> Invoice
> Report
> Table
> Manuscript
> Letter

17. The mean gross words per minute for the six types of production copy was:

Invoice	11.13
Table	11.27
Manuscript	16.07
Report	17.07
Letter	19.47
Memorandum	21.13

Findings for All Instructional Levels

1. The least number of keystroking errors was made on tables, invoices, and letters (three to five), and the greatest number of keystroking errors was made on manuscripts, reports, and memorandums (seven to seven and one-half).

2. There were few significant differences in decision-making errors among types of copy.

3. The gross words per minute rate on longhand copy was consistently lower than typewritten copy although the difference was not great enough to be statistically significant.

4. More errors were made on longhand copy than type-written copy although the differences were not great enough to be statistically significant.

5. From one to four errors were not detected in the proofreading process.

6. A table and an invoice were typed at approximately the same keystroking speed.

7. A letter and a report were typed at approximately the same keystroking speed.

8. Alphabetic copy was typed from ten to fifteen words per minute faster than numeric copy.

9. More time was spent setting up tables and reports than any other type of copy.

Conclusions and Recommendations

The following conclusions and recommendations are made on the basis of the findings of this study. The conclusions have been organized into related groupings with corresponding recommendations.

I. Conclusions

The decision-making speed of the student does not increase as the instructional level increases.

The decision-making errors of the student do not decrease as the instructional level increases.

I. Recommendation

The instructional time spent in teaching the student to make decisions should be increased.

II. Conclusions

The time spent in typing longhand copy does not decrease as the instructional level increases.

The student keystrokes longhand copy at a slower rate than typewritten copy.

The student makes a greater number of keystroking errors on longhand copy than on typewritten copy.

II. Recommendations

More longhand copy should be used in production teaching and testing.

Textbooks should contain more longhand copy.

III. Conclusion

At all levels of instruction, tabulation is the most difficult production task for the student to set up and type.

III. Recommendation

More instructional time should be devoted to teaching table set-up.

IV. Conclusion

The higher the IQ of the student the faster the student makes decisions.

IV. Recommendation

The typewriting teacher should be aware of individual differences in student learning rates and should allocate instructional time in order that more time may be spent with the lower ability student in teaching production activities.

V. Conclusion

Students type alphabetic copy faster than numeric copy.

V. Recommendations

More instructional time should be devoted to teaching numeric keys.

Textbooks should include more numeric copy.

VI. Conclusion

Production tasks should be taught in the following order at all levels of instruction: memorandums, reports, letters, manuscripts, invoices, and tables.

VI. Recommendation

The order of presentation of production tasks in typewriting textbooks should be changed from: (1) memorandums, letters, tables, manuscripts, reports, and invoices; or (2) letters, tables, manuscripts, memorandums, invoices, and reports as presented in the two leading typewriting textbooks to: memorandums, reports, letters, manuscripts, invoices, and tables.

VII. Conclusion

As the instructional level increases, the student does not increase in proofreading ability.

VII. Recommendation

More instructional time should be spent in teaching the student to proofread.

VIII. Conclusions

As the level of instruction increases, students become more accurate on both alphabetic and numeric copy.

The time spent in erasing an original decreases as the instructional level increases.

The time spent in typing a carbon, erasing the carbon, and proofreading decreases as the instructional level increases.

VIII. Recommendation

More instructional time should be spent in teaching erasing, handling carbon packs, and proofreading at semester two than at semester four and above.

IX. Conclusions

As the copy increases in keystroking difficulty, students type slower but make fewer keystroking errors.

As the copy becomes more difficult to set up, students take longer to set up the copy but make fewer decision-making errors.

IX. Recommendations

Time should be spent in speed drills on difficult copy to increase keystroking speed.

Time should be spent in speed drills on the decision-making aspects of production jobs in order to increase decision-making speed.

X. Conclusions

As the copy decreases in keystroking speed difficulty, students make more keystroking errors.

As the copy becomes easier to set up, students make more decision-making errors.

X. Recommendation

Time should be spent in accuracy drills on the decision-making aspects of easy production jobs in order to decrease decision-making errors.

XI. Conclusion

Students at all levels of instruction find copy more difficult to type when it contains proofreader's marks.

XI. Recommendations

More instructional time should be spent in teaching proofreader's marks.

Textbooks should contain more copy with proofreader's marks.

XII. Additional Conclusions

As the instructional level increases, the student gains more skill in typing letters than other production tasks.

Students make fewer errors on numeric copy than on alphabetic copy.

As the instructional level increases, the student spends a greater percentage of time in keystroking on production activities.

A student may be operating at high, average, or low anxiety in the typewriting classroom, but this anxiety level will have no affect on the speed with which the student makes decisions.

The adequacy of the student's self concept will not affect the speed with which the student makes decisions.

XIII. Additional Recommendation

The standards established in this study should be used in the second semester and fourth semester high school classes. However, the standards established for the more than four-semester student are considered atypical and should be used only in a class with similar characteristics as described in Chapter V.

XIV. Recommendations for Future Research

One unforseen problem encountered in this study was the small and atypical sample for more than four semesters of typewriting instruction. It is recommended that a future study be done in which the purposes of this study are replicated with a larger sample and with full-time day students with more than four semesters of typewriting enrolled in community colleges and universities.

Future studies should be undertaken to set standards at the three levels of instruction for easy copy and for difficult copy.

Future studies should be undertaken to set standards for the first and third semesters on easy, average, and difficult copy.

Future studies should be undertaken in an attempt to discover what contributes to decision-making speed.

APPENDICES

APPENDIX A

Figure 1

April 15, 1975

Mr. Robert Cooper
Mountain Lake College
4849 Western Avenue
Dallas, TX   75211

Dear Mr. Cooper:

I have been advised by Mr. Stanley Ferguson, repre-
sentative of David-Perry, Inc., that as chairman
of the Business Division at Mountain Lake, you may
be able to help me with learning objectives for
Introduction to Business.

We plan to adopt Lake and Murphy's sixth edition,
Introduction to Modern Business. I need all the
help I can get in writing a syllabus with learning
objectives. Since you are using this textbook,
could you send me a copy of a syllabus that I might
go by. Any suggestions you may give me will be
greatly appreciated. I need to do this during the
holidays.

I know this is a pressing time to make such a re-
quest, but circumstances prevent me from waiting
any longer to start this project.

Sincerely yours,

Mrs. Ethel Wilson

pjf

Standard Words: 168
Average Word Length: 5.6
Syllable Intensity: 1.5
High Frequency Words: 77 per cent

177

Figure 2

Current date

Mr. Robert Cooper
Chairman, Business Division
Mountain Lake College
4849 Western Avenue
Dallas, TX 75211
Dear Mr. Cooper:

I am the new chairman of the Department of Business and
Economics at Southern University and am most anxious to
get to know you.

The faculty and I would like for you and three or four of
your representatives to join us for an informal luncheon
to be held here on campus on Thursday, April 15.

I promise that no speeches will be given. We would be
interested in discussing any questions you may have con-
cerning our program and transfer credit. We do want you
to know that everyone in our department shares your interests
in educating the business student.

Would you please let us know whether or not you can attend?

We are looking forward to meeting you on April 15.

Sincerely,

Richard Bookman
Chairman

Standard Words: 168
Average Word Length: 5.5
Syllable Intensity: 1.5
High Frequency Words: 77 per cent

Figure 3

Current date

Mr. Robert Cooper

Chairman, Division of Business

Mountain Lake College

4849 Western Avenue

Dallas, TX 75211

Standard Words:	165
Average Word Length:	5.7
Syllable Intensity:	1.6
High Frequency Words:	78
per cent	

Dear Mr. Cooper:

A few weeks ago I communicated with you about the matter of our department's acceptance of some 24 hours of Mid-Management course work credit from your college. It appears that this 24 hour acceptance program or

one of a similar nature, equally or more favorable, will become a reality in the very near future.

At that time, I understand there will be teams from Midwest's College of Business available to visit your campus and consult with you and members of your faculty.

Thank you for working patiently with us on this important policy matter. In the final analysis, the quality of your program and faculty warrants this policy change on our part.

Best regards.

Sincerely,

J. F. Henderson

Figure 4

Current date

Mr. Robert Cooper

Business Department Chairman

Standard Words: 170
Average Word Length: 5.7
Syllable Intensity: 1.5
High Frequency Words:
78 per cent

Mountain Lake College

4849 Western Avenue

Dallas, TX 75211

Dear Mr. Cooper:

Thanks for sending Mountain Lake's program for the office occupations workshop. As you can see from the enclosed program, I just incorporated it into the complete workshop program.

Will you or someone from Mountain Lake campus please introduce each of your participants and serve as moderator for the program.

Claude Allen informed me that he had talked to Ed Kirk about Mountain Lake providing funds for the coffee. I assume you are aware of this; but in case you aren't, contact Claude.

I appreciate your effort and that of the other Mountain Lake staff members in planning the program. I know you will do an outstanding job.

If you need additional information, or I can help you in any way, please let me know.

Sincerely,
Linda Edwards

Figure 5

Current date

Mr. Robert Cooper

Mountain Lake College

Standard Words:	170
Average Word Length:	5.7
Syllable Intensity:	1.5
High Frequency Words:	79 per cent

4849 Western Avenue

Dallas, TX 75211

Dear Mr. Cooper:

We are sorry that you were unable to join us for lunch last Thursday.

On Monday, April 20, you, your business and economics students and your faculty and counselors are invited to join us here on campus for a Community College Open House.

Activities begin at 1:30 p.m. followed by a picnic with band and other fun entertainment. We are sending you a program of the Open House.

Would you please convey our invitation to all students and your faculty and staff (including counselors) by posting the posters we are sending and alerting the students in your classes and by any other method you feel appropriate?

So that our Department can plan for you, would you please let us know the number from your campus who will attend these activities by Thursday, April 17?

Best wishes,

Richard Edison

Figure 6

MOTIVATION

Delegation can contribute to motivation through filling personal needs of the person. The manager who delegates is interested mainly in results. He permits his people to work out the details for themselves. he set goals, tells his people what he wants done, fixes the limits within which they can work, and lets them decide how to achieve these goals. The manager explains why and points out how their contribution fits into the overall plan. He gives each person the maximum freedom he can handle consistent with the aims of the organization.

Delegation if a form of job enlargement. The desire for knowledge is a basic impulse in human beings. People want to know what is happening and why--especially to themselves. People strive to satisfy needs only to the extent that there is a chance of success--reward. Through delegation, a person can take pride in results that are attributable to his own judgement. He is involved in decisions. He has an opportunity to learn.

Standard Words: 195
Average Word Length: 5.7
Syllable Intensity: 1.6
High Frequency Words: 7.6 per cent

Figure 7

<u>Long Range Planning</u>

¶ Management finds that the worth of short range planning depends for the ~~most~~ part upon the use of long range planning and the successful combining of long range and short range profit plans.

¶ The main task of the manager is to harmonize in every decision and action the needs of the immediate and the long range future. He cannot sacrifice either without hurting the company. If he does not take care of the next hundred days, there will be no next hundred years. Indeed, there may not even be a next five years. Whatever the manager does should be sound in expediency as well as in basic long range objectives. And, where he cannot harmonize the two time dimensions, he must at least balance them. He must carefully think through the sacrifice he imposes on the long range future of the company to protect its immediate interests, or the sacrifice he makes today for the sake of tomorrow.

Standard Words: 204
Average Word Length: 5.6
Syllable Intensity: 1.5
High Frequency Words: 75 percent

Figure 8

Projection of Management Thought

The development of management thought has been an evolving one from the days of Adam Smith, and management thought will continue to evolve. In the next decade, I feel the managers will have to know even more about human behavior and human relations than today. In our affluent society, man is not concerned with lower (the) needs of survival. He has reached a higher level of needs. In order that managers may know more about human behavior, I feel that a more liberal education is necessary rather than a

specialized one. Perhaps an undergraduate degree in the humanities with a graduate degree in business would help. ¶ The manager of the future will ~~want~~ need to solve some problems brought about by the large business. According to packard, the large business is producing blandness in top management. He suggests that managers should understand not only the business but also the social and political world. He sees shortcomings in the pyramid structure. When all the power is at the top, yes-men emerge.

Standard Words: 200

Average Word Length: 5.8
Syllable Intensity: 1.6

High Frequency Words: 77 per cent

Figure 9

The Development of Management

The development of management has been and is today a continual process. Management has changed through the years and will continue to change as our society undergoes change. Just as management rules have evolved and changed over the years, so have rules economic. Adam Smith advocated a laissez faire policy in regard to government's role in the economy. He felt that government had but three roles which consisted of maintaining national defense, domestic justice, and public works. Today,

we consider government interference in our economy with the use of monetary and fiscal policy a necessity. We can no longer assume that employment will stabilize at full employment or that the economy will pull itself out of bad times. Thus, government's role today is of major importance. ¶ Just as Smith adopted a laissez faire attitude as to government's role in business, he also saw no place for management within the firm. Smith felt saw division of labor as the answer to all problems.

Standard Words: 203
Average Word Length: 5.7
Syllable Intensity: 1.6
High Frequency Words: 75 per cent

Figure 10

Corporate Planning

¶ Better planning is perhaps the most talked of need in business today. This is true for many reasons. Some of these reasons reasons are: rapid growth, new dimensions in size, rapid change, more competition, and the other quite complex problems faced by industry in the atomic age.

The most important reason for planning is opportunity-- opportunity to make a profit from new products or new ways of doing things. A planning system of is best when it is broad enough to include not only

plans for the solution of problems, but plans for the discovery of opportunities as well.

Broad planning is the continued forming of objectives for a company and the guidance of its affairs toward their completion. Any company, institution, or establishment with a desire to succeed will make planning for its future a worthwhile activity.

Corporate planning is the shorter term which means broad planning by a business concern. The main purpose of ~~purpose~~ corporate planning is the combining of different areas of emphasis.

Standard Words: 197
Average Word Length: 5.8
Syllable Intensity: 1.5
High Frequency Words: 76 per cent

Figure 11

|

/3

ᵗᵇ CAPITALISM

|
3

Standard Words: 210
Average Word Length: 5.8
Syllable Intensity: 1.6
High Frequency
Words: 75 per cent

Capitalism, as we know it in the United States today, has changed to a great degree from the classical economic system. The classical world put men, capital, and resources together to produce what the people of that day needed and wanted. The market was a self-regulating system. This system worked, but it did require the economic institutions that were present one hundred to two hundred years ago.

One of the main problems that we face today is in regard to government's role in our economy. How big a part should our government play? Government is without a doubt the most important single power in business.

a. <u>Government Regulation</u>. Government regulates business and takes much of the time of business by requiring that they fill out social security and tax forms. Government has a large role in our economy today.[1]

b. <u>Government Subsidizes</u>. In the farm industry, government has subsidized to a large extent. Some people feel that these subsidies are not needed.[2]

_____ *2"*

[1] John Galbraith, <u>American Capitalism</u> (New York, 1952), p. 6.

[2] George Bach, <u>Economic Principles</u> (New Jersey, 1954), p. 154.

Figure 12

DETERRENTS TO THE CREATIVE LEVEL

What are some deterrents to a person operating at the creative

learning level in higher education? One deterrent seems to be the ad-

mission policies of the college or university. Students who have a

low grade point average during their high school years and who do not

do well on the ACT, SAT, or whatever test is given are not allowed to

enter college. Yet, entrance exams are concerned with testing a cogni-

tive knowledge in subject areas.[1] This knowledge may be based on the

most concrete level of thinking. Students who have not done well in

school do not do well on the tests. The faculty members and the curri-

culum requirements all too often involve conformity to a narrow range

of expectations.[2]

The tests given do not claim to measure intelligence, creativity,

or the ability to see relationships. The tests claim to be able to

measure how well a student will do in college.

[1]William B. Michael, Teaching for Creative Endeavor (Bloomington, 1968),
pp. 360-389.

[2]Ibid., pp. 400-410.

Standard Words: 200
Average Word Length: 5.8
Syllable Intensity: 1.6
High Frequency Words: 75 per cent

Figure 13

Community College Faculty

Is the community college faculty member a unique being? Does he have traits that set him apart from teachers in other areas of education? What are his values?

Monroe reports that the community college teacher comes mainly from the middle or lower-middle class family.[1] Thus, the community college teacher tends to have values that are common to the middle class values. The community college teacher thinks hard work is a good, admires students that study hard, and people that conform to the rules of the college. Because of his values, the community college teacher has trouble

relating to students that come from the lower class.

Craven suggests that the community college faculty may not be as similar to the high school or to the university faculty due to the wide variety of programs offered at the community college level.[2]

[1] John D. Monroe, The Community College (Englewood Cliffs, 1970), pp. 25-30.

[2] Arthur Craven, Community College Concept (New York, 1974), pp. 31-35.

Standard Words: 204
Average Word Length: 5.8
Syllable Intensity: 1.6
High Frequency Words: 78 per cent

Figure 14

Governance

A word that has been much in the forefront in all colleges and universities recently has been "governance." Monroe states that governance is a term that describes all parts of control from the state constitution, state boards of education, local boards, the top administration in the college, the faculty, and the students.[1]

Deegan did a survey of 92 colleges in California on how much of a part students take in governing colleges.[2] He found that 52 junior colleges reported they have a vote on faculty committees and students in 61 junior colleges reported they have a vote

on administrative committees. However, the quality of student participation in governance needs to be looked at. Are students informed about issues? Do they make a positive contribution to meetings?

What is the future of governance in the community college. All readings point to the fact that both faculty and student participation in governance will increase.

[1] William Monroe, The Junior College (New York, 1973), pp. 156-160.

[2] Arthur Deegan, The Open Door (New York, 1970), pp. 356-370.

Standard Words: 210
Average Word Length: 5.8
Syllable Intensity: 1.6
High Frequency Words: 75 per cent

Figure 15

The Future of the Community College

What is the potential of the community college? What is its direction? What will happen in the future?

Higher education has faced some problems in the last few years. The university has been confronted with student revolt, relevancy, student governance, etc. The community college has also felt the impact of these problems. For almost twenty years, the community college enjoyed a period of growth and public support. However, the rosy future began to fade around 1969. The public began to question the value of higher education for

all of the youth of the nation.[1]

Although the problems are many, the majority of the writers in the community college field feel that the future for the community college is a bright one. Reynolds states that its future is assured. He sees a sharp increase in programs of technical education for the students of the future.[2]

---

[1] George Cross, Community and Junior College (New York, 1973), p. 85.

---

[2] Maxwell Reynolds, The Community College (Englewood Cliffs, 1972), p. 83.

Figure 16

DEPARTMENTAL CORRESPONDENCE

DATE _____ Current date _____

SUBJECT _____ Session with Mr. Gerald Spalding _____

TO _____ John Edwards _____ DEP'T _____ Accounting _____

FROM _____ David Martin _____ DEP'T _____ Personnel _____

A two-hour session with Mr. Gerald Spalding is being offered to all Mountain Lake College professional staff members on Friday, April 11, from 1:00 to 3:00 p.m. in room W181. Mr. Spalding was formerly with Crisis Intervention Center and will discuss a transactional analysis model for recognizing student behavior related to possible crisis situations. The Counseling Center has worked with Mr. Spalding in the past, and we have every reason to believe this is a needed session and will be well worth the time for all of us. Please urge the members of your professional staff to attend this session.

Those of you on the Administration Council received a notice from Glen Rogers on April 1 indicating that the Administrative Council meeting would not be held on Friday, April 11. The meeting was postponed as we originally thought it would conflict with the session with Mr. Spalding; however, we were able to schedule this session for the afternoon as indicated in the above paragraph. Therefore, the morning is free for the council meeting.

pjf

Standard Words: 204
Average Word Length: 5.5
Syllable Intensity: 1.6
High Frequency Words: 78 per cent

Figure 17

DEPARTMENTAL CORRESPONDENCE

DATE __Current__

SUBJECT___Chairman of Business Division_____

To___Business Faculty_____ DEP'T_____

FROM ___David Hall_____ DEP'T __Administration_____

After screening and interviewing candidates for the position of
Chairman of the Business Division, I am recommending to the May
Board meeting that Mr. Edwin Kirk serve in this role for the next
year. The candidates for this position were very outstanding and
the decision was a difficult one. However, it was our opinion that
Mr. Kirk was the best qualified person to manage the Division and
to provide outstanding instructional leadership for those of you in
the Business Division.

I know that each of you looks forward to working with Mr. Kirk and
that he is no stranger to your Division. I do not want the announce-
ment of Mr. Kirk's appointment to this position (by this memorandum)
to seem cold and impersonal, and I am sure you are aware that Mr. Bond
and I plan to meet with your division on April 20. Mr. Kirk will
attend this session with us.

I know that under Mr. Kirk's leadership your division will continue
to make significant progress.

Standard Words: 203
Average Word Length: 5.7
Syllable Intensity: 1.6
High Frequency Words: 77 per cent

Figure 18
DEPARTMENTAL CORRESPONDENCE

TOPS FORM 3397 LITHO IN U.S.A.

DATE _____

SUBJECT: _Environmental Control Systems_

TO: _Mountain Lake College Employees_ DEP'T: _____

FROM: _David Bailey_ DEP'T: _Administration_

In continuing our energy conservation program, we will be installing an "Environmental Control System" during the early part of May. This system, an IBM Computer (System Seven), is designed to monitor and control the electrical power (peak load) requirements for the entire campus.

The amount of electrical power used will be controlled by turning off preselected air handlers and return air fans in various locations in the building for short periods of time. This system will operate much like a home heating

and air conditioning system, cycling off and on for short periods of time. We are the first community college in the United States to install this type of control system. There will be a trial and error period while getting the computer ready for an operation that will be low in cost and also be efficient. For the system to obtain the highest degree of efficiency at a minimum of cost and energy consumption, we are requesting the cooperation of all students and staff members.

Figure 19

TOPS FORM 3397 LITHO IN U.S.A.

DEPARTMENTAL CORRESPONDENCE

DATE _____

SUBJECT _____ *Community College Workshops* _____

TO _____ *All Career Instructors* _____ DEP'T _____

FROM _____ *David Martin* _____ DEP'T _____

In accordance with our continuing effort to provide educational development for instructors, the District has scheduled three workshops for instructors in technical-occupational education. These workshops are to be conducted by Mr. Lee Owens. Attached is a notice of the workshops plus a blank for you to use if you want to sign up.

Please note that the first workshop is directed toward instructors who have not had the chance to attend a district or campus in-service workshop. However,

it is open to any and all instructors regardless of the education they have had previously. The second and third work-shops are designed for all personnel in the district.

Also attached is a notice of a job opening for a position in the District's education project for students working part-time. Anyone that wants to be considered should contact Mr. Owens June 20.

If you have any questions about either the workshops or the position that is vacant, please contact Mr. Ed Kirk at 215-1617.

```
Standard Words:  206
Average Word Length:  5.8
Syllable Intensity:  1.6
High Frequency Words:  75 per cent
```

Figure 20
207

TOPS FORM 3397 LITHO IN U.S.A.

DEPARTMENTAL CORRESPONDENCE

DATE _____

SUBJECT _____ Human Potential Seminar

TO _____ Roger Miller _____ DEP'T Humanities

FROM _____ David Bailey _____ DEP'T Administration

You have recently received correspondence from Pat Bourds, Anne Eden, and Jeanne Bolger about the Human Potential Seminar to be held April 20 and 30. This seminar is open to all faculty, classified employees, and administrators on a volunteer basis, and I hope that you will ask the staff members that work with you to attend this activity and that you will seriously consider joining one of these groups for your own personal growth and development.

Since this activity requires two days absence from the campus,

it will be necessary for all staff members to obtain approval from their supervisor to attend the seminar. In the case of faculty members, the classes must be covered by part-time substitutes and/or other members of the Division. Classified work stations should be covered as it is necessary. In all cases, every effort should be made to allow staff members to attend the seminar. Please call my office if you have any questions about this seminar.

Standard Words: 203
Average Word Length: 5.8
Syllable Intensity: 1.6
High Frequency Words: 78 per cent

Figure 21

North Lake Company

4849 Western Ave. • **Dallas, Texas 72039** • **746-2369**

INVOICE NO.	33856	CUSTOMER'S ORDER	FL-899	DATE	Current

```
S
O  •  Mrs. Patricia Miller
L
D     811 West First
T     Dallas, TX  75201
O
```

DATE SHIPPED	SHIPPED VIA	TERMS	SALESMAN	
4-1-75	Transcon Express	2/10, n/30	Marcia Tucker	

QUANTITY	DESCRIPTION	UNIT PRICE		AMOUNT	
2 reams	8 1/2 by 11 letterheads	5	50	11	00
2 reams	8 1/2 by 11 plain bond paper	4	50	9	00
2 reams	8 1/2 by 11 onionskin paper	3	50	7	00
2 boxes	Standard snap-out carbon packs	5	00	10	00
1 box	Carbon paper	7	00	7	00
1 dozen	IBM carbon ribbons	2	00	24	00
1 dozen	IBM standard ribbons	2	50	30	00
2 reams	8 1/2 by 14 plain bond paper	6	00	12	00
2 reams	8 1/2 by 14 onionskin paper	5	00	10	00
1 box	Standard envelopes, No. 10	7	00	7	00
1 box	Small envelopes, No. 8	8	00	8	00
1 box	Erasers	5	00	5	00
	Total			140	00

Standard Words: 118

Figure 22

210

North Lake Company

4849 Western Ave.   ·   **Dallas, Texas 72039**   ·   **746-2369**

INVOICE NO. 78923   CUSTOMER'S ORDER 45690   DATE Current

S
O   ·   Mary R. Shipp
L
D   1983 Tanglewood
T   Dallas, TX 75201
O

DATE SHIPPED	SHIPPED VIA	TERMS	SALESMAN	
4-1-75	Transcon Express	2/10, n/30	Ralph Martin	

QUANTITY	DESCRIPTION	UNIT PRICE		AMOUNT	
9	Four-drawer filing cabinets, standard finish, style #1805	85	10	765	90
15	Counter-height (3-drawer) filing cabinets, standard finish, style #1855	64	25	963	75
84	Frames for pendaflex file folders, style #812	1	35	113	40
2	Single pedestal desks, 60" x 30", style #15021-S1, custom finish	140	00	280	00
23	Desk trays, letter size, style #032	2	05	47	15
2	Office chairs, side arm chairs, style #198, custom finish	75	00	150	00
2	Fully automatic Bryan calculators, 10 bank, model STW-10	825	00	1,650	00
5	Two-drawer filing cabinets, standard finish, style #1063	25	00	125	00
				3,993	10

Standard Words: 120

Figure 23
North Lake Company

4849 Western Ave.   ·   Dallas, Texas 72039   ·   746-2369

INVOICE NO. **75689**   CUSTOMER'S ORDER **D9-345**   DATE **Current**

S O L D T O · Harold Grimes
4242 Avenue L
Dallas, TX 75201

DATE SHIPPED	SHIPPED VIA	TERMS	SALESMAN		
4-1-75	Transon Express	2/10, n/30	Harvey Rogers		

QUANTITY	DESCRIPTION	UNIT PRICE		AMOUNT	
4	Legal-size filing cabinets	75	50	302	00
6	Adjustable posture chairs	42	50	255	00
8	Letter-size filing cabinets	70	50	564	00
1	Executive desk, 78" X 38" style 15001, custom finish	210	00	210	00
1	Executive chair, style C-198, top grain leather	100	00	100	00
2	Calculating machine desks, style 15027-R, metal gray finish	110	00	220	00
2	Electric national typewriters, 12" carriage, pica type	350	00	700	00
2	Dayton printing calculators, model #96	655	00	1965	00
4	Harper electronic calculators, #99	100	00	400	00
	Total			4,716	00

Standard Words: 120

Figure 24

North Lake Company

4849 Western Ave.   ·   Dallas, Texas 72039   ·   746-2369

INVOICE NO. **99532**   CUSTOMER'S ORDER **C3-434**   DATE **Current**

SOLD TO:
J. R. Franks
1215 First Avenue
Springfield, IL 62706

DATE SHIPPED	SHIPPED VIA	TERMS	SALESMAN
4-1-75	Transon Express	2/10, n/30	R. E. Smith

QUANTITY	DESCRIPTION	UNIT PRICE	AMOUNT
4 qts.	White paint, water base	4 50	18 00
5 qts.	Yellow paint, water base	4 50	22 50
10 qts.	Wood paste filler	1 00	10 00
6 qts.	Paint thinner	2 00	12 00
3 gals.	White glue	3 00	9 00
5 qts.	Blue paint, oil base	6 00	30 00
8 qts.	Black paint, water base	4 50	36 00
6 qts.	Green paint, oil base	6 00	36 00
8 qts.	Varnish	1 50	12 00
9 qts.	Red paint, water base	4 50	40 50
10 qts.	Red paint, oil base	6 00	60 00
11 qts.	Yellow paint, oil base	6 00	66 00
13 pts.	Sealer	1 00	13 00
5 sheets	Sandpaper	50	2 50
	Total		367 50

Standard Words: 117

Figure 25

213

North Lake Company

4849 Western Ave. • Dallas, Texas 72039 • 746-2369

INVOICE NO. **34589**   CUSTOMER'S ORDER **D 8-563**   DATE *Current*

S
O
L
D
T
O

Rex Randell
1853 Fort North Avenue
Dallas, TX 75211

DATE SHIPPED	SHIPPED VIA	TERMS	SALESMAN
4-1-75	Dranson Express	2/10, n/30	Jack Jacobs

QUANTITY	DESCRIPTION	UNIT PRICE	AMOUNT
2	Automatic garage door openers	167 50	335 00
1 doz.	Radiant wall heaters	400 00	400 00
2 doz.	Radiant ceiling heaters	300 00	600 00
1 doz	Oven hood-fans	150 00	150 00
2 doz.	Built-in mixer-blenders	50 00	100 00
1 doz.	Wall exhaust fans	50 00	50 00
1 doz.	Ceiling exhaust fans	75 00	75 00
6	Outdoor lights, brass	100 00	600 00
8	Outdoor grills, brass	150 00	1200 00
1 doz.	Hot water heaters	50 00	50 00
8	Air conditioners, 2 ton	500 00	4000 00
3	Air Conditioners, 1 ton	400 00	1200 00
	Total		8760 00

Standard Words: 118

Figure 26

PRICE LIST FOR ACADEMIC ATTIRE

Fabric Name	Bachelor's Gown	Master's Gown	Doctor's Gown
Tropical Palm	$13.50	$18.75	$26.00
Lusta Faille	14.50	20.25	30.00
Facet Crepe	15.50	22.25	14.00
Mendel Crepe	16.00	21.00	35.00
Bromley Faille	16.60	24.25	38.00
Major Faille	17.50	26.25	42.00
Diamond Cloth	18.50	28.25	46.00
Willow Faille	19.50	30.25	50.00
Aspera Faille	20.50	32.25	54.00
Century Faille	21.50	34.25	58.00
Wina Faille	22.50	36.25	62.00
Barathea	23.50	38.25	66.00
Regal Faille	24.50	40.25	70.00
Wonda	25.50	41.25	72.00
Crown Faille	26.50	43.25	74.00
Crown Barathea	27.50	44.25	75.00
Crown Cloth	28.50	45.25	76.00

Standard Words: 110

Figure 27

ANALYSIS OF LISTENERS OF KLIN

Program	Females	Males	Total
Dick Murray Show	30,000	15,000	45,000
Roger Morris Show	20,000	20,000	40,000
Clyde Owens Show	13,000	25,000	38,000
Herb Cline Show	8,000	30,000	38,000
Don Dayton Show	10,000	20,000	30,000
Don Harrison Show	10,000	20,000	30,000
Stan Evans Show	15,000	15,000	30,000
Ruth Morris Show	25,000	5,000	30,000
Ann Edwards Show	35,000	10,000	45,000
Pam Clark Show	25,000	15,000	40,000
Susan Gray Show	30,000	5,000	35,000
Mike Bennett Show	10,000	30,000	40,000
Ralph Martin Show	5,000	25,000	30,000
Thomas Irwin Show	8,000	22,000	30,000
Ted Nelson Show	15,000	30,000	45,000

Standard Words: 112

Figure 28

Textbook Requisition List

Author, Title	Number	Unit Price	Amount
Strong, How We			
Travel on Water	90	$3.00	#270.00
Vincent, How			
Trains Work	100	2.00	200.00
Botts, How			
Airplanes Work	50	4.00	200.00
Karr, Adventures			
in Art	75	2.00	150.00
Morgan, Let's			
Read for Fun	80	3.00	240.00
Pitman, How			
Cars Work	90	4.00	360.00

Bowles, Adventures in Science	100	5.00	500.00
Russon, ABC's	80	3.00	240.00
Edwards, Animals	70	2.00	140.00
Rogers, All About Birds	60	1.00	60.00
Foster, Life in the City	30	2.00	60.00
Foster, Life in the Country	30	2.00	60.00
Maxwell, Good Eating Habits	20	1.00	20.00
Roth, Fun in the Sun	10	1.00	10.00
Total			$ 2,150.00

Words: 114

Figure 29

Betrum Thompson Department Store Sales

Department	January	February	March
Ladies Shoes	$ 840.12	$ 660.13	$ 489.90
Dresses and Lingerie	2,450.37	3,200.17	4,561.25
Cosmetics	500.15	600.17	900.18
Jewelry	89.48	95.35	103.36
Sweaters and Blouses	385.67	435.78	497.90
Furs	816.57	730.69	500.89
Children's Clothes	800.00	900.00	1,000.00
Linens	650.35	800.50	900.00
Housewares	1,115.25	2,000.75	3,100.15
Furniture	2,345.67	2,890.75	1,500.76
Appliances	1,500.65	1,200.55	2,100.78
Books and Records	456.00	500.00	750.00

Men's Shirts	500.00	700.00	800.00
Men's Shoes	515.00	625.00	725.00
Men's Suits	1,437.50	1,896.50	2,225.00
Hats	200.00	300.00	315.00

Standard Words: 113

Figure 30

Nationwide Weekly Salary Data for Jobs in EDP

Job Title	Low	Average	High
Lead Systems Analyst	$201	$205	$273
Senior Systems Analyst	180	210	249
Junior Systems Analyst	149	180	207
Lead Programmer	176	200	242
Senior Programmer	154	184	210
Junior Programmer	126	145	173
Lead Computer Operator	138	150	186
Senior Computer Operator	138	150	186
Junior Computer Operator	100	120	134
Lab Equipment Manager	144	150	194
Lead Lab Equipment Operator	114	125	150
Senior Lab Equipment Operator	99	120	131

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Junior Lab Equipment Operator   89   110   116
Senior Keypunch Operator   80   90   100
Junior Keypunch Operator   70   80   90
Keypunch Supervisor   110   120   124

Standard Words: 113

APPENDIX B

Figure 31

DIRECTIONS FOR TEACHERS

Second Semester Typewriting

<u>Arranged</u> <u>Copy</u>

1. The students will type the arranged jobs during the first
    six days of the testing period, with one job per day being
    typed.

2. You will record only the time the student spends in
    actually typing the job. All machine adjustments will be
    made in advance. These instructions are given on the stu-
    dent instruction sheet.

3. You will start the timing for all students at the same
    time. As the student finishes the typing, he is to raise
    his hand so that you may record time. A sheet with the
    student's name and a place to record time has been pro-
    vided.

4. You will record time only for the first job. However,
    so that the validity and reliability of the study will
    not be destroyed, the students will continue to type copy
    which is timed for the rest of the period. Have the
    student raise his hand after he finishes each job.
    However, you <u>will</u> <u>not</u> record time for the remainder of
    the jobs.

5. On each of the six days for the arranged copy, read
    over the directions with the students. All directions
    are given for machine adjustments.

6. Ask the students to bring only typing paper to class
    with them. Since there will be no erasing on these
    jobs, the quality of the paper does not matter.

<u>Unarranged</u> <u>Copy</u>

The next group of jobs will be typed in the next twelve days
with two jobs per day being typed. The order of the work
conditions will be as listed on the following page.

1. Unarranged longhand copy with no erasing

   invoice forms
   rough-draft report copy

2. Unarranged longhand copy with erasing

   letter
   table

3. Unarranged longhand copy with erasing, typing and correcting one carbon copy and proofreading

   letter
   table

4. Unarranged longhand copy with erasing, typing and correcting one carbon copy, and proofreading

   invoice forms
   rough-draft report copy

5. Unarranged typewritten copy with no erasing

   manuscripts
   memorandums

6. Unarranged typewritten copy with no erasing

   invoice forms
   rough-draft report copy

7. Unarranged longhand copy with erasing, typing and correcting one carbon copy, and proofreading

   manuscripts
   memorandums

8. Unarranged longhand copy with no erasing

   manuscripts
   memorandums

9. Unarranged longhand copy with no erasing

   letter
   table

10. Unarranged typewritten copy with no erasing

> letter
> table

11. Unarranged longhand copy with erasing

> invoice forms
> rough-draft report copy

12. Unarranged longhand copy with erasing

> manuscripts
> memorandums

Directions for Unarranged Copy

UNARRANGED TYPEWRITTEN COPY WITH NO ERASING

1. The students are to type two jobs per day. The jobs are arranged in the order in which they are to be typed.

2. Directions for the jobs are included. Please read over the directions with the students at the beginning of the period.

3. Please do not answer questions concerning placement of the jobs, etc. One of the purposes of this study is to find out the time involved in decision making; therefore, no more directions other than the ones provided are to be given.

4. Start timing all students at the same time. As each student finishes, record his time on the sheet provided. Record the time to the nearest half minute.

5. You will record time on only the first two jobs. However, so that the validity and reliability of the study will not be destroyed, the students will continue to type copy which is timed for the rest of the period. Have the student raise his hand after he finishes each job.

6. If the student has not finished Job 2 by the end of the period, do not record time. The only time scores that will be recorded are on completed jobs.

7. Ask the students to bring only typing paper to class with them. Since there will be no erasing on these jobs, the quality of the paper does not matter.

UNARRANGED LONGHAND COPY WITH NO ERASING

Same instructions as typewritten copy.

UNARRANGED LONGHAND COPY WITH ERASING

Same directions for 1--6

7. Ask students to bring the following supplies to class:

        16 weight bond paper--not erasable
         1 stick typewriter eraser

UNARRANGED LONGHAND COPY WITH ERASING, TYPING AND CORRECTING
ONE CARBON COPY, AND PROOFREADING

Same directions for 1--6

7. Ask the students to bring the following supplies to
    class:

        16 weight bond paper--not erasable
         1 stick typewriter eraser
         onionskin paper
         carbon paper --no carbon packs

Figure 32

DIRECTIONS FOR TEACHERS

Fourth Semester Typewriting and
More than Four Semesters

Arranged Copy

1. The students will type the arranged jobs during the
   first six days of the testing period, with one job per
   day being typed.

2. You will record only the time the student spends in
   actually typing the job. All machine adjustments will
   be made in advance. These instructions are given on
   the student instruction sheet.

3. You will start the timing for all students at the same
   time. As the student finishes the typing, he is to
   raise his hand so that you may record time. A sheet
   with the student's name and a place to record time has
   been provided.

4. You will record time for the first job only. However,
   so that the validity and reliability of the study will
   not be destroyed, the students will continue to type
   copy which is timed for the rest of the period. Have
   the student raise his hand after he finishes each job.
   However, you will not record time for the remainder of
   the jobs.

5. On each of the six days for the arranged copy, read over
   the directions with the students. All directions are
   given for machine adjustments.

6. Ask the students to bring only typing paper to class
   with them. Since there will be no erasing on these
   jobs, the quality of the paper does not matter.

Unarranged Copy

The next group of jobs will be typed in the next eight days
with three jobs per day being typed. The order of the work
conditions will be:

1. Unarranged longhand copy with no erasing

        letter
        table
        report

2. Unarranged longhand copy with erasing, typing and
    correcting one carbon copy, and proofreading

            memorandums
            invoices
            manuscripts

3. Unarranged longhand copy with erasing

            letter
            table
            report

4. Unarranged longhand copy with erasing, typing and
    correcting one carbon copy, and proofreading

            letter
            table
            report

5. Unarranged typewritten copy with no erasing

            letter
            table
            report

6. Unarranged longhand copy with no erasing

            memorandums
            invoices
            manuscripts

7. Unarranged longhand copy with erasing

            memorandums
            invoices
            manuscripts

8. Unarranged typewritten copy with no erasing

            memorandums
            invoices
            manuscripts

Directions for Unarranged Copy

UNARRANGED TYPEWRITTEN COPY WITH NO ERASING

1. The students are to type three jobs per day. The jobs are arranged in the order in which they are to be typed.

2. Directions for all three jobs are included. Please read over the directions with the students at the beginning of the period.

3. Please do not answer questions concerning placement of the jobs, etc. One of the purposes of this study is to find out the time involved in decision making; therefore, no more directions other than the ones provided are to be given.

4. Start timing all students at the same time. As each student finishes, record his time on the sheet provided. Record the time to the nearest half minute.

5. You will record time on only the first three jobs. However, so that the validity and reliability of the study will not be destroyed, the students will continue to type copy which is timed for the rest of the period. Have the student raise his hand after he finishes each job.

6. If the student has not finished Job 3 (or Job 2) by the end of the period, do not record time. The only time scores that will be recorded are on completed jobs.

7. Ask the students to bring only typing paper to class with them. Since there will be no erasing on these jobs, the quality of the paper does not matter.

UNARRANGED LONGHAND COPY WITH NO ERASING

Same instructions as typewritten copy

UNARRANGED LONGHAND COPY WITH ERASING

Same directions for 1--6.

7. Ask students to bring the following supplies to class:

         16 weight bond paper--not erasable
         1 stick typewriter eraser

UNARRANGED LONGHAND COPY WITH ERASING, TYPING AND CORRECTING
ONE CARBON COPY, AND PROOFREADING

Same directions for 1--6.

7. Ask the students to bring the following supplies to
    class:

            16 weight bond paper--not erasable
             1 stick typewriter eraser
             onionskin paper
             carbon paper--no carbon packs

Figure 33

TIME RECORD

Teacher's Name_____ Period No. _____

Course_____ Date _____

Time (nearest half minute)

Student	Job 1	Job 2	Job 3
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Figure 34

STUDENT INFORMATION SHEET

Name_____

Age_____

Male_____   Female_____

Number of Semesters of Typewriting_____

Figure 35

STUDENT DIRECTIONS

DIRECTIONS: Arranged typewritten copy with no erasing--
             letters

1. You will type modified block letters with blocked
    paragraphs during this class period.

2. Each letter has been set up in the correct format.
    Your letter should look exactly like the copy from
    which you are typing. Return your carriage exactly
    as the copy. You will not need to listen for your
    bell.

3. You will be timed while you type the letters but not
    while you make your machine adjustments.

4. You will need only typing paper for the jobs.

5. Clear your desk of all your other belongings by putting
    your books, etc. on the floor or under your desk.

6. You are to do no erasing during the testing so put your
    typewriter eraser away so that you will not pick it up
    by mistake.

7. Your paper will be scored on the words per minute you
    type plus the number of errors you make. Try to type
    as accurately as possible.

8. Make your machine adjustments for the letters now. All
    letters are average letters.

    a. Set your paper guide at 0.
    b. Set a tab at center point.
    c. Set the line space regulator for single spacing.
    d. Use a 5-inch line. Set your left margin at 20 for an
        elite type. Do not set your right margin. Return
        your carriage exactly as the copy.
    e. Block paragraphs.
    f. Double space between paragraphs.
    g. Type date on line 15.
    h. After you type the date, return your carriage 5 times
        before typing the inside address.
    i. The number of times you should return the carriage
        after each letter part is indicated on the copy.

9. Place a sheet of paper in your machine now. Space down to line 15 and over to center point ready to begin typing the date.

10. Do not start typing until your teacher instructs you to do so.

11. After you have finished typing Job 1, raise your hand so that your teacher can record your time.

12. Immediately begin typing Job 2. After you have finished Job 2, raise your hand so that your teacher can record your time.

13. Continue in this same manner until the end of the class period.

14. It is extremely important that you raise your hand after you finish each job. Unless you do so, the words per minute that you have typed on each job cannot be computed.

Figure 36

DIRECTIONS: Arranged typewritten copy with no erasing--
              memorandums

1. You will type interoffice memorandums during this class
    period.

2. Each memorandum has been set up in the correct format.
    Your memorandum should look exactly like the copy from
    which you are typing. Return your carriage exactly as
    the copy. You will not need to listen for your bell.

3. You will be timed while you type the memorandums but not
    while you make your machine adjustments.

4. You will need only memorandum forms for these jobs. Your
    teacher will supply the forms.

5. Clear your desk of all your other belongings by putting
    your books, etc. on the floor or under the desk.

6. You are to do no erasing during the testing so put your
    typewriter eraser away so that you will not pick it up
    by mistake.

7. Your paper will be scored on the words per minute you
    type plus the number of errors you make. Try to type
    as accurately as possible.

8. Make your machine adjustments for the memorandums now.

    a. Set the line space regulator for single spacing.
    b. Block paragraphs.
    c. Double space between paragraphs.
    d. Set your left margin on 12 for an elite typewriter.
        Do not set your right margin. Move the right margin
        all the way to the right. Return your carriage just
        as it is on the copy.
    e. After you type the information opposite the guide-
        words, return your carriage 3 times before starting
        the body of the memorandum.

9. Place a memorandum form in your machine now. Space down
    to the first guideword and over to your left margin ready
    to begin typing.

10. Do not start typing until your teacher instructs you to do so.

11. After you have finished typing Job 1, raise your hand so that your teacher can record your time.

12. Immediately begin typing Job 2. After you have finished Job 2, raise your hand so that your teacher can record your time.

13. Continue in this same manner until the end of the class period.

14. It is extremely important that you raise your hand after you finish each job. Unless you do so, the words per minute that you have typed on each job cannot be computed.

Figure 37

DIRECTIONS: Arranged typewritten copy with no erasing--
              manuscripts

1. You will type manuscripts during this class period.

2. Each manuscript has been set up in the correct format.
    Your manuscript should look exactly like the copy from
    which you are typing. Return your carriage exactly as
    the copy. You will not need to listen for your bell.

3. You will be timed while you type the manuscripts but
    not while you make your machine adjustments.

4. You will need only typing paper for the jobs.

5. Clear your desk of all your other belongings by putting
    your books, etc. on the floor or under your desk.

6. You are to do no erasing during the testing so put your
    typewriter eraser away so that you will not pick it up
    by mistake.

7. Your paper will be scored on the words per minute you
    type plus the number of errors you make. Try to type
    as accurately as possible.

8. Make your machine adjustments for the manuscripts now.
    The manuscripts are unbound.

    a. Set your paper guide at 0.
    b. Set a tab at center point.
    c. Set the line space regulator for double spacing.
    d. Set your left margin on 12 for an elite machine. You
        do not need to set a right margin since you will
        return your carriage exactly as the copy. Move the
        right margin all the way to the right.
    e. Indent paragraphs.
    f. Type the title on line 13.
    g. After typing the title leave two blank lines before
        starting the body.
    h. Separate the footnotes from the body of the report
        with a 2-inch line of underscores.

9. Place a sheet of paper in your machine now. Space down
    to line 13. The horizontal position for the title is
    indicated on the copy.

10. Do not start typing until your teacher instructs you to do so.

11. After you have finished typing Job 1, raise your hand so that your teacher can record your time.

12. Immediately begin typing Job 2. After you have finished Job 2, raise your hand so that your teacher can record your time.

13. Continue in this same manner until the end of the class period.

14. It is extremely important that you raise your hand after you finish each job. Unless you do so, the words per minute that you have typed on each job cannot be computed.

Figure 38

DIRECTIONS: Arranged typewritten copy with no erasing--
invoice forms

1. You will type invoice forms during this class period.

2. Each invoice has been set up in the correct format. Your
invoice should look exactly like the copy from which you
are typing.

3. You will be timed while you type the invoice forms but
not while you make your machine adjustments.

4. You will need only invoice forms for these jobs. Your
teacher will supply the forms.

5. Clear your desk of all your other belongings by putting
your books, etc. on the floor or under your desk.

6. You are to do no erasing during the testing so put your
typewriter eraser away so that you will not pick it up
by mistake.

7. Your paper will be scored on the words per minute you
type plus the number of errors you make. Try to type
as accurately as possible.

8. To type the information after invoice number, customer
order, and date, space twice after the guide word.

9. To type the information after "sold to," space twice
after the black dot.

10. To type the information under "date shipped," "shipped
via," "terms," and "salesman," space twice after the
vertical line.

11. To set the left margin, space twice from the extreme
left vertical line. Do not set a right margin.

12. To set tab for "description" column, space twice from
line and set tab.

13. To set tab for "unit price," backspace once from line
under the "p" in price and set tab.

14. To set tab for "amount," backspace twice from line under
the "n" in amount and set tab.

15. Place an invoice form in your machine now. Space down to "invoice no." and over to the position to begin typing.

16. Do not start typing until your teacher instructs you to do so.

17. After you have finished typing Job 1, raise your hand so that your teacher can record your time.

18. Immediately begin typing Job 2. After you have finished Job 2, raise your hand so that your teacher can record your time.

19. Continue in this same manner until the end of the class period.

20. It is extremely important that you raise your hand after you finish <u>each</u> job. Unless you do so, the words per minute that you have typed on each job cannot be computed.

Figure 39

DIRECTIONS: Arranged typewritten copy with no erasing--reports

1. You will type reports during this class period.

2. Each report has been set up in the correct format. Your
    problem should look exactly like the copy from which
    you are typing.

3. You will be timed while you type the reports but not
    while you make your machine adjustments.

4. You will need only typing paper for the job.

5. Clear your desk of all your other belongings by putting
    your books, etc. on the floor or under your desk.

6. You are to do no erasing during the testing so put your
    typewriter eraser away so that you will not pick it up
    by mistake.

7. Your paper will be scored on the words per minute you
    type plus the number of errors you make. Try to type as
    accurately as possible.

8. Make your machine adjustments for the first report now.

    a. Set the paper guide at 0.
    b. Clear all margins and tab stops.
    c. Set the line space regulator for double spacing.
    d. Set your left margin on 12 for an elite machine.
        Do not set a right margin. Return your carriage
        just as it is on the copy.
    e. Set a tab stop 5 spaces from the left margin.

9. Place a piece of paper in your machine.

10. Space down to line 13. The horizontal position for the
    title is indicated on your copy. After typing the
    heading, leave two blank lines before beginning the body
    of the report.

11. Do not start typing until your teacher instructs you to
    do so.

12. After you have finished typing Job 1, raise your hand
    so that your teacher can record your time.

13. Immediately begin typing Job 2. After you have finished Job 2, raise your hand so that your teacher may record your time.

14. Continue in this same manner until the end of the class period.

15. It is extremely important that you raise your hand after you finish each job. Unless you do so, the words per minute that you have typed on that job cannot be computed.

Figure 40

DIRECTIONS: Arranged typewritten copy with no erasing--
              tabulation

1. You will type tabulation problems during this class
   period.

2. Each tabulation problem has been set up in the correct
   format. Your problem should look exactly like the
   copy from which you are typing.

3. You will be timed while you type the tabulation problem
   but not while you make your machine adjustments.

4. You will need only typing paper for the job.

5. Clear your desk of all your other belongings by putting
   your books, etc. on the floor or under your desk.

6. You are to do <u>no</u> erasing during the testing so put your
   typewriter eraser away so that you will not pick it up
   by mistake.

7. Your paper will be graded on the words per minute you
   type plus the number of errors you make. Try to type
   as accurately as possible.

8. Make your machine adjustments for the first tabulation
   problem now.

   a. Set the paper guide at 0.
   b. Clear all margins and tab stops.
   c. Double space the problem.
   d. Set the margins and tab stops as indicated on the
      copy.
   e. Do not set tabs for the column heads since you will
      type them only once. The space where you will type
      the column heads and the title are indicated on
      your copy.

9. Place a piece of paper in your machine. Space down to the
   line indicated on your copy to get ready to begin typing
   the title.

10. Do not start typing until your teacher instructs you to
    do so.

11. After you have finished typing Job 1, raise your hand so that your teacher may record your time.

12. Immediately begin making your machine adjustments for Job 2. Type Job 2. After you have finished Job 2, raise your hand so that your teacher may record your time.

13. Continue in this same manner until the end of the class period.

14. It is extremely important that you raise your hand after you finish each job. Unless you do so, the words per minute that you typed on this job cannot be computed.

Figure 41

UNARRANGED COPY DIRECTIONS FOR SECOND SEMESTER

DIRECTIONS: Unarranged longhand copy with erasing

1. You will type the following jobs during this class period:

      letter
      table

2. Set up all jobs in the correct format.

3. Type the letters in modified block style with blocked paragraphs.

4. Arrange the table on a full sheet of paper. Center the table both vertically and horizontally on the page. You decide on the spaces between columns.

5. You will need the following supplies for these jobs:

      16 weight bond paper--not erasable
      1 stick typewriter eraser

6. Get out your supplies now.

7. Clear your desk of all your other belongings by putting your books, etc. on the floor or under your desk.

8. You will be timed as you set up and type the jobs so <u>do</u> <u>not</u> make any machine adjustments until your teacher starts the timing.

9. Carefully erase all of your errors.

10. After you have finished typing Job 1, raise your hand so that your teacher can record your time.

11. Immediately begin making your machine adjustments for Job 2. Type Job 2. After you have finished Job 2, raise your hand so that your teacher can record your time.

12. Continue in this same manner until the end of the class period.

13. It is extremely important that you raise your hand after you finish _each_ job. Unless you do so, the words per minute that you have typed on that job cannot be computed.

Figure 42

DIRECTIONS: Unarranged longhand copy with no erasing

1. You will type the following jobs during this class period:

   invoice forms
   rough-draft report copy

2. Set up all jobs in the correct format. Use appropriate margins for each job.

3. Notice that there are proofreader's marks in the report. Be sure that you correct these marks.

4. You will need forms for the invoices. Your teacher will supply these.

5. You will need only typing paper for the report copy.

6. You are to do no erasing during the testing so put your typewriter eraser away so that you will not pick it up by mistake.

7. Clear your desk of all your other belongings by putting your books, etc. on the floor or under your desk.

8. Your paper will be scored on the words per minute you type plus the number of errors you make. Try to type as accurately as possible.

9. You will be timed as you set up and type the jobs so do not make any machine adjustments until your teacher starts the timing.

10. After you have finished typing Job 1, raise your hand so that your teacher can record your time.

11. Immediately begin making your machine adjustments for Job 2. Type Job 2. After you have finished Job 2, raise your hand so that your teacher can record your time.

12. Continue in this same manner until the end of the class period.

13. It is extremely important that you raise your hand after you finish each job. Unless you do so, the words per minute that you have typed on that job cannot be computed.

Figure 43

DIRECTIONS: Unarranged longhand copy with erasing, typing
               and correcting one carbon copy, and proofreading

1. You will type the following jobs during this class period:

        letter
        table

2. Set up all jobs in the correct format. Use appropriate
    margins for each job.

3. Type the letters in modified block style with blocked
    paragraphs.

4. Arrange the table on a full sheet of paper. Center the
    table both vertically and horizontally on the page.
    You decide on the spaces between columns.

5. You will need the following supplies for these jobs:

        16 weight bond paper--not erasable
        1 typewriter eraser
        onionskin paper
        1 piece of carbon paper

6. Assemble all of your supplies. Arrange your work station
    so that all supplies are accessible.

7. Make one carbon copy of each job.

8. Erase and correct your errors on both the original and
    the carbon copy.

9. Proofread each job.

10. You will be timed as you type these jobs and as you make
    your machine adjustments.

11. Do not make any machine adjustments until your teacher
    starts the timing.

12. After you have finished typing, correcting all errors, and
    proofreading Job 1, raise your hand so that your teacher
    may record your time.

13. Immediately begin making your machine adjustments for Job 2. Type, correct your errors, and proofread Job 2. After you have finished Job 2, raise your hand so that your teacher may record your time.

14. Immediately begin making your machine adjustments for Job 3. Continue in this same manner until the end of the class period.

15. It is extremely important that you raise your hand after you finish <u>each</u> job. Unless you do so, the words per minute that you have typed on that job cannot be computed.

Figure 44

DIRECTIONS: Unarranged longhand copy with erasing, typing
              and correcting one carbon copy, and proofreading

1. You will type the following jobs during this class period:

        invoices
        rough-draft reports

2. Set up all jobs in the correct format.

3. Notice that there are proofreader's marks in the report.
    Be sure that you correct these marks.

4. You will need forms for the original copy of the invoices.
    Your teacher will supply these.

5. Use plain onionskin paper for the carbon copy of the
    invoices.

6. You will need the following supplies for these jobs:

        16 weight bond paper--not erasable
         1 stick typewriter eraser
        onionskin paper
         1 piece of carbon paper

7. Assemble all of your supplies. Arrange your work station
    so that all supplies are accessible.

8. Make one carbon copy of each job.

9. Erase and correct your errors on both the original and
    the carbon copy.

10. Proofread each job.

11. You will be timed as you type these jobs and as you make
    your machine adjustments.

12. Do not make any machine adjustments until your teacher
    starts the timing.

13. After you have finished typing, correcting all errors,
    and proofreading Job 1, raise your hand so that your
    teacher may record your time.

14. Immediately begin making your machine adjustments for Job 2. Type, correct your errors, and proofread Job 2. After you have finished Job 2, raise your hand so that your teacher may record your time.

15. Immediately begin making your machine adjustments for Job 3. Continue in this same manner until the end of the class period.

16. It is extremely important that you raise your hand after you finish each job. Unless you do so, the words per minute that you have typed on that job cannot be computed.

Figure 45

DIRECTIONS: Unarranged typewritten copy with no erasing

1.   You will type the following jobs during this class
     period:

          manuscripts
          memorandums

2.   Set up all jobs in the correct format.   Use appropriate
     margins for each job.

3.   Type the manuscripts in unbound format.

4.   You will need forms for the memorandums.   Your teacher
     will supply these.

5.   You will need only typing paper for the manuscripts.

6.   Clear your desk of all your other belongings by putting
     your books, etc. on the floor or under your desk.

7.   You are to do no erasing during the testing so put your
     typewriter eraser away so that you will not pick it up
     by mistake.

8.   Your paper will be scored on the words per minute you
     type plus the number of errors you make.   Try to type
     as accurately as possible.

9.   You will be timed as you set up and type the jobs so
     do not make any machine adjustments until your teacher
     starts the timing.

10. After you have finished typing Job 1, raise your hand
     so that your teacher can record your time.

11. Immediately begin making your machine adjustments for
     Job 2.   Type Job 2.   After you have finished Job 2,
     raise your hand so that your teacher can record your
     time.

12. Continue in this same manner until the end of the class period.

13. It is extremely important that you raise your hand after you finish each job. Unless you do so, the words per minute that you have typed on that job cannot be computed.

Figure 46

DIRECTIONS: Unarranged typewritten copy with no erasing

1. You will type the following jobs during this class period:

    invoice forms
    rough-draft report copy

2. Set up all jobs in the correct format. Use appropriate margins for each job.

3. Notice that there are proofreader's marks in the report. Be sure that you correct these marks.

4. You will need forms for the invoices. Your teacher will supply these.

5. You will need only typing paper for the report copy.

6. Clear your desk of all your other belongings by putting your books, etc. on the floor or under your desk.

7. You are to do no erasing during the testing so put your typewriter eraser away so that you will not pick it up by mistake.

8. Your paper will be scored on the words per minute you type plus the number of errors you make. Try to type as accurately as possible.

9. You will be timed as you set up and type the jobs so do not make any machine adjustments until your teacher starts the timing.

10. After you have finished typing Job 1, raise your hand so that your teacher can record your time.

11. Immediately begin making your machine adjustments for Job 2. Type Job 2. After you have finished Job 2, raise your hand so that your teacher can record your time.

12. Continue in this same manner until the end of the class period.

13. It is extremely important that you raise your hand after you finish each job. Unless you do so, the words per minute that you have typed on that job cannot be computed.

Figure 47

DIRECTIONS: Unarranged longhand copy with erasing, typing
             and correcting one carbon copy, and proofreading

1. You will type the following jobs during this class period:

        manuscripts
        memorandums

2. Set up all jobs in the correct format.

3. Type the manuscripts in unbound format.

4. You will need forms for the original copy of the
    memorandums. Your teacher will supply these.

5. Use plain onionskin paper for the carbon copy of the
    memorandums.

6. You will need the following supplies for these jobs:

        16 weight bond paper--not erasable
         1 stick typewriter eraser
        onionskin paper
         1 piece of carbon paper

7. Assemble all of your supplies. Arrange your work station
    so that all supplies are accessible.

8. Make one carbon copy of each job.

9. Erase and correct your errors on both the original and
    the carbon copy.

10. Proofread each job.

11. You will be timed as you type these jobs and as you make
     your machine adjustments.

12. Do not make any machine adjustments until your teacher
     starts the timing.

13. After you have finished typing, correcting all errors, and proofreading Job 1, raise your hand so that your teacher may record your time.

14. Immediately begin making your machine adjustments for Job 2. Type, correct your errors, and proofread Job 2. After you have finished Job 2, raise your hand so that your teacher may record your time.

15. Immediately begin making your machine adjustments for Job 3. Continue in this same manner until the end of the class period.

16. It is extremely important that you raise your hand after you finish each job. Unless you do so, the words per minute that you have typed on that job cannot be computed.

Figure 48

DIRECTIONS: Unarranged longhand copy with no erasing

1. You will type the following jobs during this class period:

        manuscripts
        memorandums

2. Set up all jobs in the correct format. Use appropriate margins for each job.

3. Type the manuscripts in unbound format.

4. You will need forms for the memorandums. Your teacher will supply these.

5. You will need only typing paper for the manuscripts.

6. You are to do no erasing during the testing so put your typewriter eraser away so that you will not pick it up by mistake.

7. Clear your desk of all your other belongings by putting your books, etc. on the floor or under your desk.

8. Your paper will be scored on the words per minute you type plus the number of errors you make. Try to type as accurately as possible.

9. You will be timed as you set up and type the jobs so do not make any machine adjustments until your teacher starts the timing.

10. After you have finished typing Job 1, raise your hand so that your teacher can record your time.

11. Immediately begin making your machine adjustments for Job 2. Type Job 2. After you have finished Job 2, raise your hand so that your teacher can record your time.

12. Continue in this same manner until the end of the class period.

13. It is extremely important that you raise your hand after you finish each job. Unless you do so, the words per minute that you have typed on that job cannot be computed.

Figure 49

DIRECTIONS: Unarranged longhand copy with no erasing

1. You will type the following jobs during this class period:

    letter
    table

2. Set up all jobs in the correct format. Use appropriate
    margins for each job.

3. Type the letters in modified block style with blocked
    paragraphs.

4. Arrange the table on a full sheet of paper. Center the
    table both vertically and horizontally on the page. You
    decide on the spaces between columns.

5. You will need only typing paper for the jobs.

6. You are to do no erasing during the testing so put your
    typewriter eraser away so that you will not pick it up by
    mistake.

7. Clear your desk of all your other belongings by putting
    your books, etc. on the floor or under your desk.

8. Your paper will be scored on the words per minute you
    type plus the number of errors you make. Try to type
    as accurately as possible.

9. You will be timed as you set up and type the jobs so
    do not make any machine adjustments until your teacher
    starts the timing.

10. After you have finished typing Job 1, raise your hand
     so that your teacher may record your time.

11. Immediately begin making your machine adjustments for
     Job 2. Type Job 2. After you have finished Job 2,
     raise your hand so that the teacher may record your time.

12. Continue in this same manner until the end of the class
     period.

13. It is extremely important that you raise your hand after
     you finish each job. Unless you do so, the words per
     minute that you have typed on that job cannot be computed.

Figure 50

DIRECTIONS: Unarranged typewritten copy with no erasing

1. You will type the following jobs during this class period:

        letter
        table

2. Set up all jobs in the correct format. Use appropriate margins for each job.

3. Type the letters in modified block style with blocked paragraphs.

4. Arrange the table on a full sheet of paper. Center the table both vertically and horizontally on the page. You decide on the spaces between columns.

5. You will need only typing paper for the jobs.

6. Clear your desk of all your other belongings by putting your books, etc. on the floor or under your desk.

7. You are to do no erasing during the testing so put your typewriter eraser away so that you will not pick it up by mistake.

8. Your paper will be scored on the words per minute you type plus the number of errors you make. Try to type as accurately as possible.

9. You will be timed as you set up and type the jobs so do not make any machine adjustments until your teacher starts the timing.

10. After you have finished typing Job 1, raise your hand so that your teacher may record your time.

11. Immediately begin making your machine adjustments for Job 2. Type Job 2. After you have finished Job 2, raise your hand so that the teacher may record your time.

12. Continue in this same manner until the end of the class period.

13. It is extremely important that you raise your hand after you finish <u>each</u> job. Unless you do so, the words per minute that you have typed on that job cannot be computed.

Figure 51

DIRECTIONS: Unarranged longhand copy with erasing

1. You will type the following jobs during this class period:

> invoice forms
> rough-draft report copy

2. Set up all jobs in the correct format. Use appropriate margins for each job.

3. Notice that there are proofreader's marks in the report. Be sure that you correct these marks.

4. You will need forms for the invoices. Your teacher will supply these.

5. You will need the following supplies for these jobs:

> 16 weight bond paper--not erasable
> 1 stick typewriter eraser

6. Get out your supplies now.

7. Clear your desk of all your other belongings by putting your books, etc. on the floor or under your desk.

8. You will be timed as you set up and type the jobs so do not make any machine adjustments until your teacher starts the timing.

9. Carefully erase all of your errors.

10. After you have finished typing Job 1, raise your hand so that your teacher can record your time.

11. Immediately begin making your machine adjustments for Job 2. Type Job 2. After you have finished Job 2, raise your hand so that your teacher may record your time.

12. Continue in this same manner until the end of the class period.

13. It is extremely important that you raise your hand after you finish each job. Unless you do so, the words per minute that you have typed on that job cannot be computed.

Figure 52

DIRECTIONS: Unarranged longhand copy with erasing

1. You will type the following jobs during this class period:

     manuscripts
     memorandums

2. Set up all jobs in the correct format. Use appropriate
    margins for each job.

3. Type the manuscripts in unbound format.

4. You will need forms for the memorandums. Your teacher
    will supply these.

5. You will need the following supplies for these jobs:

     16 weight bond paper--not erasable
     1 stick typewriter eraser

6. Get your supplies out now.

7. Clear your desk of all your other belongings by putting
    your books, etc. on the floor or under your desk.

8. You will be timed as you set up and type the jobs so do
    not make any machine adjustments until your teacher
    starts the timing.

9. Carefully erase all of your errors.

10. After you have finished typing Job 1, raise your hand
     so that your teacher can record your time.

11. Immediately begin making your machine adjustments for
     Job 2. Type Job 2. After you have finished Job 2,
     raise your hand so that your teacher may record your
     time.

12. Continue in this same manner until the end of the class
     period.

13. It is extremely important that you raise your hand after
     you finish each job. Unless you do so, the words per
     minute that you have typed on that job cannot be computed.

Figure 53

UNARRANGED COPY DIRECTIONS FOR FOURTH SEMESTER

DIRECTIONS: Unarranged longhand copy with no erasing

1. You will type the following jobs during this class period:

     letter
     table
     report

2. Set up all jobs in the correct format. Use appropriate
    margins for each job.

3. Type the letters in modified block style with blocked
    paragraphs.

4. Arrange the table on a full sheet of paper. Center the
    table both vertically and horizontally on the page. You
    decide on the spaces between columns.

5. Notice that there are proofreader's marks in the report.
    Be sure that you correct the copy.

6. You will need only typing paper for the jobs.

7. Clear your desk of all your other belongings by putting
    your books, etc. on the floor or under your desk.

8. You are to do <u>no</u> erasing during the testing so put your
    typewriter eraser away so that you will not pick it up
    by mistake.

9. Your paper will be scored on the words per minute you
    type plus the number of errors you make. Try to type
    as accurately as possible.

10. You will be timed as you set up and type the jobs so <u>do</u>
    <u>not</u> make any machine adjustments until your teacher
    starts the timing.

11. After you have finished typing Job 1, raise your hand
    so that your teacher can record your time.

12. Immediately begin making your machine adjustments for
    Job 2. Type Job 2. After you have finished Job 2,
    raise your hand so that your teacher can record your
    time.

13. Continue in this same manner until the end of the class period.

14. It is extremely important that you raise your hand after you finish _each_ job. Unless you do so, the words per minute that you have typed on that job cannot be computed.

Figure 54

DIRECTIONS: Unarranged longhand copy with erasing, typing
             and correcting one carbon copy, and proofreading

1. You will type the following jobs during this class period:

        memorandums
        invoices
        manuscripts

2. Set up all jobs in the correct format.

3. Type the manuscripts in unbound format.

4. You will need forms for the original copy of the memo-
    randums and invoices. Your teacher will supply these.

5. Use plain onionskin paper for the carbon copy of the
    memorandums and invoices.

6. You will need the following supplies for these jobs:

        typewriter eraser
        16 weight bond paper--not erasable
        onionskin paper
        1 piece of carbon paper

7. Assemble all of your supplies. Arrange your work station
    so that all supplies are accessible.

8. Make one carbon copy of each job.

9. Erase and correct your errors on both the original and
    the carbon copy.

10. Proofread each job.

11. You will be timed as you type these jobs and as you make
     your machine adjustments.

12. Do not make any machine adjustments until your teacher
     starts the timing.

13. After you have finished typing, correcting all errors, and proofreading Job 1, raise your hand so that your teacher may record your time.

14. Immediately begin making your machine adjustments for Job 2. Type, correct your errors, and proofread Job 2. After you have finished Job 2, raise your hand so that your teacher may record your time.

15. Immediately begin making your machine adjustments for Job 3. Continue in this same manner until the end of the class period.

16. It is extremely important that you raise your hand after you finish each job. Unless you do so, the words per minute that you have typed on that job cannot be computed.

Figure 55

DIRECTIONS: Unarranged longhand copy with erasing

1. You will type the following jobs during this class period:

      letter
      table
      report

2. Set up all jobs in the correct format.

3. Type the letters in modified block style with blocked paragraphs.

4. Arrange the table on a full sheet of paper. Center the table both vertically and horizontally on the page. You decide on the spaces between columns.

5. Notice that there are proofreader's marks in the report. Be sure that you correct these marks.

6. You will need the following supplies for these jobs:

      16 weight bond paper--not erasable
      1 stick typewriter eraser

7. Get out your supplies now.

8. Clear your desk of all your other belongings by putting your books, etc. on the floor or under your desk.

9. You will be timed as you set up and type the jobs so do not make any machine adjustments until your teacher starts the timing.

10. Carefully erase all of your errors.

11. After you have finished typing Job 1, raise your hand so that your teacher can record your time.

12. Immediately begin making your machine adjustments for Job 2. Type Job 2. After you have finished Job 2, raise your hand so that your teacher may record your time.

13. Continue in this same manner until the end of the class period.

14. It is extremely important that you raise your hand after you finish <u>each</u> job. Unless you do so, the words per minute that <u>you</u> have typed on that job cannot be computed.

Figure 56

DIRECTIONS: Unarranged longhand copy with erasing, typing
              and correcting one carbon copy, and proofreading

1. You will type the following jobs during this class period:

    letter
    table
    report

2. Set up all jobs in the correct format.

3. Type the letters in modified block style with blocked
    paragraphs.

4. Arrange the table on a full sheet of paper. Center the
    table both vertically and horizontally on the page. You
    decide on the spaces between columns.

5. Notice that there are proofreader's marks in the reports.
    Be sure to type the report correctly.

6. You will need the following supplies for these jobs:

    typewriter eraser
    16 weight bond paper--not erasable
    onionskin paper
    1 piece of carbon paper

7. Assemble all of your supplies. Arrange your work station
    so that all supplies are accessible.

8. Make one carbon copy of each job.

9. Erase and correct your errors on both the original and
    the carbon copy.

10. Proofread each job.

11. You will be timed as you type these jobs and as you make
     your machine adjustments.

12. Do not make any machine adjustments until your teacher
     starts the timing.

13. After you have finished typing, correcting all errors, and proofreading Job 1, raise your hand so that your teacher may record your time.

14. Immediately begin making your machine adjustments for Job 2. Type, correct your errors, and proofread Job 2. After you have finished Job 2, raise your hand so that your teacher may record your time.

15. Immediately begin making your machine adjustments for Job 3. Continue in this same manner until the end of the class period.

16. It is extremely important that you raise your hand after you finish each job. Unless you do so, the words per minute that you have typed on that job cannot be computed.

Figure 57

DIRECTIONS: Unarranged typewritten copy with no erasing

1. You will type the following jobs during this class period:

    letter
    table
    report

2. Set up all jobs in the correct format. Use appropriate margins for each job.

3. Type the letters in modified block style with blocked paragraphs.

4. Arrange the table on a full sheet of paper. Center the table both vertically and horizontally on the page. You decide on the spaces between columns.

5. Notice that there are proofreader's marks in the report. Be sure that you correct these marks.

6. You will need only typing paper for the jobs.

7. You are to do no erasing during the testing so put your typewriter eraser away so that you will not pick it up by mistake.

8. Clear your desk of all your other belongings by putting your books, etc. on the floor or under your desk.

9. Your paper will be scored on the words per minute you type plus the number of errors you make. Try to type as accurately as possible.

10. You will be timed as you set up and type the jobs so do not make any machine adjustments until your teacher starts the timing.

11. After you have finished typing Job 1, raise your hand so that your teacher may record your time.

12. Immediately begin making your machine adjustments for Job 2. Type Job 2. After you have finished Job 2, raise your hand so that the teacher may record your time.

13. Continue in this same manner until the end of the class period.

14. It is extremely important that you raise your hand after you finish _each_ job. Unless you do so, the words per minute that you have typed on that job cannot be computed.

Figure 58

DIRECTIONS: Unarranged longhand copy with no erasing

1. You will type the following jobs during this class period:

    memorandums
    invoices
    manuscripts

2. Set up all jobs in the correct format. Use appropriate margins for each job.

3. Type the manuscripts in unbound format.

4. You will need forms for the memorandums and invoices. Your teacher will supply these.

5. You will need only typing paper for the manuscripts.

6. You are to do <u>no</u> erasing during the testing so put your typewriter era<u>ser</u> away so that you will not pick it up by mistake.

7. Clear your desk of all your other belongings by putting your books, etc. on the floor or under your desk.

8. Your paper will be scored on the words per minute you type plus the number of errors you make. Try to type as accurately as possible.

9. You will be timed as you set up and type the jobs so <u>do</u> <u>not</u> make any machine adjustments until your teacher starts the timing.

10. After you have finished typing Job 1, raise your hand so that your teacher can record your time.

11. Immediately begin making your machine adjustments for Job 2. Type Job 2. After you have finished Job 2, raise your hand so that your teacher can record your time.

12. Continue in this same manner until the end of the class period.

13. It is extremely important that you raise your hand after you finish _each_ job. Unless you do so, the words per minute that you have typed on that job cannot be computed.

Figure 59

DIRECTIONS: Unarranged longhand copy with erasing

1. You will type the following jobs during this class
    period:

            memorandums
            invoices
            manuscripts

2. Set up all jobs in the correct format.

3. Type the manuscripts in unbound format.

4. You will need forms for the memorandums and invoices.
    Your teacher will supply these.

5. You will need the following supplies for these jobs:

            16 weight bond paper--not erasable
            1 stick typewriter eraser

6. Get out your supplies now.

7. Clear your desk of all your other belongings by putting
    your books, etc. on the floor or under your desk.

8. You will be timed as you set up and type the jobs so <u>do</u>
    <u>not</u> make any machine adjustments until your teacher
    starts the timing.

9. Carefully erase all of your errors.

10. After you have finished typing Job 1, raise your hand so
    that your teacher can record your time.

11. Immediately begin making your machine adjustments for
    Job 2. Type Job 2. After you have finished Job 2, raise
    your hand so that your teacher may record your time.

12. Continue in this same manner until the end of the class
    period.

13. It is extremely important that you raise your hand after
    you finish each job. Unless you do so, the words per
    minute that you have typed on that job cannot be computed.

Figure 60

DIRECTIONS: Unarranged typewritten copy with no erasing

1. You will type the following jobs during this class period:

        memorandums
        invoices
        manuscripts

2. Set up all jobs in the correct format.   Use appropriate
    margins for each job.

3. Type the manuscripts in unbound format.

4. You will need forms for the memorandums and invoices.
    Your teacher will supply these.

5. You will need only typing paper for the manuscripts.

6. You are to do no erasing during the testing so put your
    typewriter eraser away so that you will not pick it up
    by mistake.

7. Clear your desk of all your other belongings by putting
    your books, etc. on the floor or under your desk.

8. Your paper will be scored on the words per minute you type
    plus the number of errors you make.   Try to type as
    accurately as possible.

9. You will be timed as you set up and type the jobs so do
    not make any machine adjustments until your teacher starts
    the timing.

10. After you have finished typing Job 1, raise your hand so
     that your teacher can record your time.

11. Immediately begin making your machine adjustments for
     Job 2.   Type Job 2.   After you have finished Job 2, raise
     your hand so that your teacher can record your time.

12. Continue in this same manner until the end of the class
     period.

13. It is extremely important that you raise your hand after
     you finish each job.   Unless you do so, the words per
     minute that you have typed on that job cannot be computed.

Figure 61

DEPARTMENTAL CORRESPONDENCE

278

DATE _____

SUBJECT_____

TO _____ DEP'T _____

FROM _____ DEP'T _____

Figure 62

279

North Lake Company

4849 Western Ave.   ·   **Dallas, Texas 72039**   ·   **746-2369**

INVOICE NO.	CUSTOMER'S ORDER	DATE

S
O ·
L
D
T
O

DATE SHIPPED	SHIPPED VIA	TERMS	SALESMAN

QUANTITY	DESCRIPTION	UNIT PRICE	AMOUNT

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