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AN EVALUATION OF VOCATIONAL SHORTHAND COMPETENCY

ATTAINED IN UTAH HIGH SCHOOLS

by

Alden A. Talbot

A thesis submitted in partial fulfillment
of the requirements for the degree

of

MASTER OF SCIENCE

in

Business Education

UTAH STATE UNIVERSITY
Logan, Utah

1969

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Finally, the writer wishes to acknowledge the sacrifices and understanding of his fiance, Sheila; to her this project is dedicated.

Alden A. Talbot

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ABSTRACT

An Evaluation of Vocational Shorthand Competency

Attained in Utah High Schools

by

Alden A. Talbot, Master of Science

Utah State University, 1969

Major Professor: Dr. Ted D. Stoddard

Department: Business Education

A sample U. S. Civil Service shorthand test was given to 2,336 students of 66 Utah high school shorthand instructors to determine the efficiency of shorthand students in taking shorthand at 80 words per minute and transcribing it with 95 per cent accuracy. The test was also used to compare shorthand achievement through the use of typewriters in shorthand instruction, the location of the school, the size of class by number of students, and the length of the class period. Test scores were used as the means of comparison.

The test results were coded and punched into cards. These cards were then tabulated by a computer and results were placed in table form for comparison at the .05 level of significance.

Only 4.31 per cent of the students taking the test passed it with 95 per cent accuracy--.4 per cent of the first-year students and 15.1 per cent of the second-year shorthand students.

The programs of teaching had no effect on the students

learning at the first- or second-year levels of instruction. The location of the school had an effect only on the second-year students where students did better in rural schools than in urban schools. The use of typewriters, class size, and class length all had a significant effect on the students' learning of shorthand according to the test results compared in this study.

(97 Pages)

CHAPTER I
INTRODUCTION

One of the main goals of shorthand instruction in high schools today is for students to acquire a vocational skill that will make them employable upon completion of the course.¹

Typical patterns of shorthand instruction in high schools in the state of Utah are: (1) one year of one-hour classes; (2) two years of one-hour classes; (3) one-hour, one year classes followed by a concentration of shorthand instruction in a secretarial practice block program the second year; (4) a two-hour block for one year; and (5) a two-hour block for both first and second years of shorthand instruction.²

The degree of shorthand success achieved from one high school to another varies considerably. Some teachers maintain that part of their students attain a marketable shorthand skill after one year; other teachers insist that two years are necessary to help students gain a marketable skill.³

¹T. H. Bell, Executive Officer, Business and Marketing Education Guide (Salt Lake City, Utah: Utah Board for Vocational Education, 1966), p. 33, and Frank J. Dame, Albert R. Brinkman, and Wilbur E. Weaver, Prognosis, and Guidance, and Placement in Business Education (Cincinnati, Ohio: South-Western Publishing Company, 1944) p. 110.

²E. Charles Parker, State Specialist, Business and Office Education, Personal interview, Salt Lake City, Utah, February 3, 1968.

³Richard D. Featheringham, "Two Years of Shorthand: A Justification," The Ohio Business Teacher, XXVI (April, 1966), 43-44.

Among those highest in demand in the work force of today are the stenographic and clerical workers.⁴ If these demands are to be met, today's shorthand students must be taught by the most effective methods and in the most favorable time period, whether that time be one year or two years.

Statement of the problem

The purpose of this study was to determine the levels of shorthand achievement which students in Utah high schools attained after (1) a one-year, one-hour shorthand class; (2) two years of one-hour shorthand class instruction; (3) one year of shorthand plus a concentration of shorthand instruction in a block program; (4) one year of two-hour class instruction; (5) two years of two-hour block instruction; or (6) other. More specifically, the objectives of the study were:

1. To determine the percentage of shorthand students who successfully completed a three-minute shorthand take at 80 words per minute with at least 95 per cent accuracy.
2. To compare differences existing in the success of the above five mentioned shorthand programs in providing students in rural high schools a marketable shorthand skill.
3. To compare differences existing in the success of the above five mentioned shorthand programs in providing students in urban high schools a marketable shorthand skill.

⁴Dickson S. Mullin, "Business Education and the Dropout Problem," The Balance Sheet, XLVII, No. 6 (1966), 246.

4. To compare any differences existing in the success of the shorthand programs in providing a marketable shorthand skill in combining rural and urban high schools.

5. To compare the shorthand achievement of the first-year shorthand students who used typewriters with those who did not use typewriters.

6. To compare the shorthand achievement of second-year shorthand students who used typewriters throughout all shorthand instruction with those who used typewriters only after the first year.

7. To compare the shorthand achievement of shorthand students by various class sizes.

8. To compare the shorthand achievement of shorthand students by class periods of varying lengths.

The achievement of these objectives was determined on the basis of the scores of students on a sample U. S. Civil Service test which was given during the week of May 13 through May 17, 1968. (See Appendix E, p. 74 for a copy of the test.)

Null hypotheses established for the study

The null hypotheses which were tested in relation to the above objectives were:

1. Students of first-year shorthand did not differ in their ability.
2. Students of second-year shorthand did not differ in their ability.
3. Students did not differ significantly in their ability to

take dictation and to transcribe their own notes because of the location of their school, whether the school was in an urban or a rural setting.

4. Students did not differ in their ability to take dictation and to transcribe their own notes because they used typewriters in classroom instruction.

5. Students did not differ in their ability to take dictation and to transcribe their own notes because of the length of the class in which the students were taught.

6. Students did not differ in their ability to take dictation and to transcribe their own notes because of the size of the class in which the students were taught.

Importance of the study

Very little research has been conducted as to the correctness of any shorthand teaching approaches or methods.⁵ Therefore, shorthand instructors have a major problem in deciding how their students compare with other shorthand students.

Crank says, "Teachers of shorthand and transcription must be always alert to improved ways of making the teaching-learning process more efficient."⁶ Weirnerman agrees by saying, "New methods should be

⁵John Phillip Calland, "The Extent to Which Currently Proposed Shorthand Methods Have Been Substantiated by Research" (Unpublished M. A. Thesis, Ohio State University, 1964), pp. 159-160.

⁶Doris H. Crank, "Three Issues in Teaching Shorthand: Materials, Procedures, and Selection of Students," Business Education Forum, XX, No. 1 (1967), 3.

researched, and those that meet the needs of the class should be adopted."⁷ West adds to these statements, "Two years of instruction are commonly thought to be desirable for the development of marketable skill with a symbolic system capable of high writing speeds."⁸

This study will show shorthand instructors throughout the state of Utah whether students in Utah are producing at the seemingly agreed upon 80 words-per-minute dictation level of competency with as much success as other students in the state who are being taught under different time-length classes and under different shorthand programs.

Studies should be made in shorthand in the secondary schools of the state of Utah in relation to job entry requirements.⁹ The instructors of shorthand in the secondary schools of Utah will be able to use this study in deciding whether one year of training in shorthand or two years of training in shorthand are necessary for students to reach vocational shorthand competency, and also in checking differences as a result of the use of typewriters, differing class sizes, differing class period lengths, and location of schools.

⁷Anne Weirnerman, "Do the Methods Used in the Development of Dictation Ability Make a Difference?" Business Education Forum, XX, No. 1 (1967), 12.

⁸Leonard J. West, "Business Education," Research Report, No. 67-11, October, 1967 (New York, New York: Division of Teacher Education of the City University of New York, 1967), p. 9.

⁹Patsy May Pehrson, "An Assessment of Typewriting Skills in the Secondary Schools of the State of Utah in Relation to Job Entry Requirements" (Unpublished M. A. Thesis, Utah State University, 1967), p. 50.

Delimitations

The problem of this study is delimited to senior high schools in the state of Utah offering shorthand instruction. The study is further restricted to an assessment of results which were obtained from a sample Federal Civil Service test which was sent to those senior high schools in the state of Utah who offer shorthand instruction and who agreed to participate in the study.

Limitations

The following limitations apply to the procedures which were followed during the study:

1. No consideration was given to teachers and students as to whether they had a complete understanding of the instructions and whether these instructions were followed correctly.
2. All tests which were sent out were not administered and returned for evaluation. A total of 1,122 tests, amounting to 32.45 per cent of the tests, were either not administered or not returned.
3. The Federal Civil Service form of testing which was used was new to most students, but was not considered to have had an effect on the results of the tests.
4. The tests were administered near the end of the school year, and year-end activities were not considered as having had an effect on the students who took the test.
5. The same test was used for all students without regard to students' experience (whether they were first- or second-year students) and without concern for the approaches which were used in teaching the students.

6. The teachers' teaching procedures, enthusiasm, preparation, and other personal traits were not considered to have an effect on the test evaluations.

Assumptions inherent in the study

The following assumptions were made concerning the validity of this study:

1. Eighty words per minute and 95 per cent accuracy are a speed of dictation and a rate of accuracy which are considered sufficient to meet the requirements of vocational competency in shorthand.

2. The shorthand students of 66 teachers in 51 of Utah's high schools participating in the shorthand test used in this study are considered adequate to make this study valid.

3. The Federal Civil Service test used for this study was considered a valid instrument for testing students involved in the test.

Definitions of terms

Entry jobs.--Initial jobs, or jobs which require no previous work experience are considered to be entry jobs.

Federal Civil Service Test.--The type of test administered by the United States Civil Service Commission involving a dictation test, three minutes in length, instructions, a transcription booklet, and a multiple-choice answer sheet (See appendixes D, E, F, G, and H for copies of the parts of the Civil Service Test used in this study.) is a Federal Civil Service test.

Marketable skill.--A skill that is developed to a state or

quality that it is ready for use in the market and desirable for future employment is considered to be a marketable skill.

Rural schools.--Rural schools are schools located in the country and smaller cities. All schools except those in Salt Lake City area, Ogden, Provo, and Logan cities were considered rural schools.

Secretary.--A secretary is a person who schedules appointments, gives information, takes dictation, and otherwise relieves officials of clerical work.¹⁰

Shorthand vocational competency.--For the purpose of this study, 80 words per minute and transcription with 95 per cent accuracy, is considered to be a speed rapid enough for dictation and a transcript accurate enough to be considered shorthand vocationally competent.

Statistical significance.--Any differences observed at the .05 significance level by analyses of the data was defined as statistical significance.

Stenographer.--A stenographer is a person who takes dictation in shorthand of correspondence, reports, and other matter, and transcribes dictated material using the typewriter.¹¹

¹⁰United States Labor Department, Bureau of Employment Security, Dictionary of Occupational Titles, 1965, Vol. I: Definitions of Titles (Third Edition, Washington, D. C.: U. S. Government Printing Office, 1965), p. 635.

¹¹United States Labor Department, p. 692.

Transcription.-- The process of coverting shorthand notes into useable written material in transcription.¹²

Urban schools.--Urban schools are defined as those schools which are located in the Salt Lake City area, Ogden City, Provo City, and Logan City.

Overview of study

Chapter two of this study gives a review of literature related to the acquisition of shorthand competency and some advantages of shorthand for vocational use.

The third chapter, based on methods and procedures, explains how the study was conducted. It is broken down into procedures used in group selection, testing procedures used, test evaluations and procedures used.

All findings of this study are given in chapter four. These findings were based on the tests given to students enrolled in first- and second-year shorthand classes under 66 teachers in 51 of Utah's high schools.

The final chapter of the study is devoted to a summary of the study, conclusions, and recommendations based upon the complete study.

¹²Donald D. Jester, The Shorthand Transcription Process and its Teaching Implications, South-Western Monographs No. 108 (Cincinnati, Ohio: South-Western Publishing Co., 1963), p. 2.

CHAPTER II
REVIEW OF LITERATURE

The literature which is related to the problem of this study is divided into two main divisions: (1) The acquisition of shorthand competency, and (2) the advantages of shorthand for a vocation.

Acquisition of shorthand competency

The demands of business and businessmen must be made known in determining the speeds and skill needed by shorthand students to make them vocationally competent.

Various studies of the rates at which businessmen dictate have revealed that speeds of even 100 words a minute are not necessary for the ordinary needs of business . . . and that the average rates at which businessmen dictate ranged from 60 to 80 words a minute . . . with as much as one-fourth dictated at less than 60 words a minute. . . .¹

Speed in dictation is often cited as a job entry requirement when a prospective employee makes application for a stenographic job. However, shorthand speed is not the only requirement of employers. The cost of letters continues to climb while the stenographer is transcribing the letter. Moreover, the transcription speed is important

¹A Comprehensive Analysis and Synthesis of Research Finding and Thought Pertaining to Shorthand and Transcription, Vol. 1, p. 187, cited by Elise D. Palmer and Sally Bulkley Pancrazio, ". . . Shorthand Selection Procedures: Are They Justifiable?" Business Education Forum, XXII, No. 1 (1967), 14.

to the businessman, and with this speed, accuracy must be incorporated. In addition, businessmen are logical in demands for transcription and for dictation if the stenographer is accurate and knowledgeable in the work she does, and businesses set a rate of eighty to ninety words a minute for dictation speeds as a minimum standard for students after two years of high-school shorthand training.²

Someone has said that most high school graduates of stenographic courses are merely "apprentice stenographers." Without entirely accepting that somewhat harsh judgment, let us say that the graduate of the one-year high school shorthand course will usually need a longer apprenticeship in the office than will the graduate of the two-year high school course. What is the reasonable difference between the two?

The graduate of the two-year high school shorthand course will be able to take dictation at a higher speed, read it back more rapidly and accurately, type more rapidly and accurately, and transcribe the shorthand notes on the typewriter more rapidly and accurately. In addition to these differences in the technical skills of the stenographer, the graduate of the two-year shorthand course should have more background knowledge of business in general and office work in particular, knowledge that the one-year shorthand graduate will have to acquire during the necessarily longer apprenticeship period on the job in the business office.³

Just how long the student should study shorthand has been a question asked by and of business teachers for many years. Some teachers still have their own thoughts on the length of time to spend for

²Samuel Goldsmith, "A Study of Standards for Typewriting and Shorthand," The Balance Sheet, XIX, No. 5 (1958), 210.

³Louis A. Leslie, Charles E. Zoubek, and Madeline S. Strony, Instructor's Handbook for Gregg Dictation, Diamond Jubilee Series (New York: Gregg Division, McGraw-Hill Book Company, Inc., 1963), p. 22.

this training and on how fast the student should be able to take shorthand to be competent and employable when the shorthand course is finished.⁴

Featheringham says:

Opponents of skill subjects are dubious as to whether or not two years of shorthand can be justified on the high school level.

There is no reason to believe that the shorthand course should be less than a two-year program when the intention of the student is vocational.⁵

Some instructors and texts refer to shorthand training as vocational, personal, or for the purpose of taking notes. However, Gregg shorthand taken in excess of one year is stamped as vocational. In Utah, "Second-year shorthand is vocational in purpose."⁶ Speaking of Gregg Shorthand West says,

. . . numerous simpler alphabetic systems and less complex symbolic systems have been developed, for which it is claimed that writing speeds of about 80 words per minute can readily be attained in from one to two semesters of instruction. These simpler systems are sometimes designated as "Personal shorthand: in the public schools."⁷

Dame, Brinkman, and Weaver refer to Gregg Shorthand as one of the objectives of vocational business education.

It specifically indicates the development of technical skills to point where the students will be prepared for the requirements

⁴Lloyd V. Douglas, James Blanford, and Ruth Anderson, Teaching Business Subjects (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1958), p. 349.

⁵Richard D. Featheringham, "Two Years of Shorthand: A Justification," The Ohio Business Teacher, XXVI (April, 1966), 43-44.

⁶T. H. Bell, Executive Officer, Business and Marketing Education Guide (Salt Lake City, Utah: Utah Board for Vocational Education, 1966), p. 33.

⁷Leonard J. West, "Business Education," Research Report, No. 67-11, October, 1967 (New York, New York: Division of Teacher Education of the City University of New York, 1967), p. 9.

of his first job and, if possible, be prepared for advancement possibilities.⁸

Ruelas agrees with the above quotation by saying,

Whatever alternative may be taken, consideration must be given to the premise that shorthand training is aimed at true vocational competency that will meet the standards and requirements of the employing community.⁹

In making a survey of ninety-seven businesses, Wilsing found:

Only twenty-nine of the ninety-seven employing units in the sample had established entrance stenographic standards. Of these, a number stated two standards--a higher figure for higher level stenographic or secretarial positions, or the speed that was desired; and the lower figure representing lower level stenographic requirements, or a speed that would be acceptable. . . . In either case, whether the lower or higher figures were employed, the median speed requirement was eighty words a minute.¹⁰

Olsen reports, "Most employers require eighty words per minute as a dictation speed with ninety-five per cent accuracy." He goes on to say that some job applicants ask to take tests at the employment offices at speeds slower than eighty words per minute such as seventy or even sixty. These slower speeds, especially sixty words per minute, are sometimes given to slower applicants, but only with the understanding that they will not be recommended for stenographer jobs.

⁸Frank J. Dame, Albert R. Brinkman, Wilbur E. Weaver, Prognosis, Guidance, and Placement in Business Education (Cincinnati, Ohio: South-Western Publishing Company, 1944), p. 110.

⁹Enrique Ruelas, "Shorthand--Salvage the Borderline Case," The Balance Sheet, XLIX, No. 4 (1967), 165.

¹⁰Weston C. Wilsing, Is Business Education in the Public High Schools Meeting the Needs and Desires of Businessmen?, South-Western Monographs No. 99 (Cincinnati, Ohio: South-Western Publishing Co., 1959), p. 25.

They usually are placed in a position as office help or clerks where occasional shorthand is required.¹¹

Are we then striving to have all our students meet the requirements for top stenographic positions, or better yet, to become shorthand writing experts?

How many times have you heard of situations in which the prospective employer states: "We want all our girls to be able to take shorthand. We actually do very little dictation, and when we do, it is quite slow, but we like to have shorthand as a job prerequisite."¹²

Advantages of shorthand

Shorthand is a rapid method of writing, according to Peck, who says:

This is a jet age! Shorthand is jet writing! The first automobile built traveled many times faster than man could walk. Today's airplanes travel faster than automobiles, jets faster than airplanes, and spaceships faster than jets. In a like manner a competent secretary writes shorthand many times faster than the employer can write longhand.¹³

Henrie notes the advantages of shorthand by stating:

Woodrow Wilson, another of our nation's presidents, used his shorthand throughout his life and carried it to the doors of success through which he passed. Shorthand may not have pushed open the doors for him, but it helped him keep the doors swinging once he was on the move. He even took his shorthand to the capitol with him, and there it helped give him speed and ability in his steps to success.¹⁴

¹¹Hyrum S. Olsen, Counselor, Logan Employment Security Offices, Personal Interview, Logan, Utah, February 27, 1968.

¹²Elise D. Palmer and Sally Bulkley Pancrazio, ". . . Shorthand Selection Procedures: Are They Justifiable?" Business Education Forum, XX, No. 1 (1967), p. 14.

¹³Gladys Peck, "Counseling Today's Students About Shorthand," Business Education Forum, XVIII (October, 1963), 15.

¹⁴Bill S. Henrie, "Executives--Via Shorthand" (Unpublished Material, Weber State College, 1966), p. 5.

Shorthand can shower students with advantages and opportunities. Students gain opportunities for personal contact that cannot be experienced in any other way. As a professional secretary, students may not only know what their boss does, but they will often go with him into important meetings and will meet the many executives who visit from other businesses.¹⁵

Here is a newspaper quotation from the Wall Street Journal that points out some of the advantages of knowing shorthand. This article was entitled, "Bosses Partial to Shorthand."

NEW YORK--A recent extensive survey of classified help-wanted ad sections in 30 large and medium-sized U. S. cities proved that no matter how an employer labels his secretary--Girl Friday, private or executive secretary, or administrative assistant--he wants a girl who knows her shorthand thoroughly.

In one Sunday edition of the New York Times alone, there were ads for 1,894 secretaries and stenographers, many of them bilingual, a surprising number of them for men, and all of them stressing shorthand. A bright, ambitious young person casting about for an exciting position could have his or her choice of advertising, law, public relations, medicine, radio and television, insurance, banking, publishing, transportation, engineering, theatre, personnel or retailing--to mention only a few.

Chicago employers wanted 300; Miami, 150; Dallas, 150, Los Angeles, 450; Detroit, 200; Seattle, 150; San Francisco, 175; Atlanta, 275; St. Louis, 150; New Orleans, 125; Washington, D. C., 150; and Boston, 125.

Salaries for shorthand writers were markedly higher than those quoted for machine operators, and the opportunities were much greater. There was considerable emphasis on trainee positions for young men interested in learning the business from the secretary's starting point.

¹⁵Frank Goldstein, A Handbook For Teachers of Business Education (Brooklyn, New York: The Caslon Press, Inc., 1958), p. 134.

Age ranges also seemed to be widening, with some localities running ads for secretaries up to age 50. It was not unusual for large firms to advertise openings for as many as 100 secretaries and stenographers, while many employment agencies simply announced, "Jobs Galore!"¹⁶

According to Leslie, shorthand is easier to learn than longhand and is very valuable as a vocational skill.¹⁷ Businessmen have answered the question of why they insist on shorthand writers as stenographers and secretaries, and they give direct reasons for feeling this way. Here are just a few:

1. They are loathe to use a dictating machine. Even though today's machines are quite simple to operate, many businessmen are not willing to take the time to learn how to use the machine and how to dictate so that the transcriber can turn out a satisfactory transcript in a reasonable length of time.

2. They prefer to dictate to a shorthand writer because they can make changes, insertions, and deletions, in their dictation more easily and quickly than they can on a dictating machine.

3. They prefer to dictate to a shorthand writer because the stenographer can supply information, prices, dates, etc., information that the businessman could have to hunt up for himself if he were dictating to a machine. Furthermore, the stenographer can often catch mistakes in grammar or in facts before transcription is started.

4. They have difficulty obtaining and holding machine transcribers; girls find machine transcription tedious.

5. In some companies, they cannot pay dictating machine operators as much as they pay stenographers and secretaries.¹⁸

Zoubek cites the following:

Recently, a teacher in the Midwest was told by her superintendent that in this day of automation machines would soon replace stenographers; therefore, he was thinking of discontinuing all shorthand offerings in the high school. The teacher decided to

¹⁶"Bosses Partial to Shorthand," The Wall Street Journal, January 12, 1960.

¹⁷Louis A. Leslie, Methods of Teaching Gregg Shorthand (New York, New York: Gregg Publishing Division, McGraw-Hill Book Company, Inc., 1953), pp. 254-255.

¹⁸Charles E. Zoubek, "Shorthand on the Way Out? Hardly!" The Business Teacher (November, 1960, Reprint), 2.

prove to him that this just wasn't so and wrote to employment services in her state and in surrounding states. Without exception, they replied that in their areas there was a crying need for stenographers and secretaries who wrote shorthand.¹⁹

Here (following) are a few excerpts from some of the letters the Midwest teacher received in reply to her letters.

From the Department of Employment Security, Minneapolis, Minnesota: ". . . This office currently has 110 openings for women who take dictation in shorthand and only six openings for transcribing machine operators. For the past several years we have never been able to come close to filling the demand for girls with shorthand proficiency . . . we sincerely hope that our schools will not do anything to aggravate the serious shortage of shorthand stenographers.

From the Montana State Employment Service: "Montana like most other states, has a shortage of qualified stenographers with a skill in shorthand. . . . We believe that too little emphasis is being placed on shorthand everywhere.

From the Wisconsin State Employment Services, Milwaukee, Wisconsin: "The man in charge of the commercial unit of this office informs me that of 50 requests currently on file for stenographers . . . not one calls for an applicant with dictating machine training.

From the Employment Security Commission, Des Moines, Iowa: "We have a constant shortage of stenographers who can take dictation. We are conducting a recruiting program in Iowa, hoping to obtain 500 girls for Des Moines offices."²⁰

Summary of chapter

Most literature found concerning this study was in agreement on speeds and skills needed for shorthand competency. The speed most often recommended was 80 words per minute with 95 per cent accuracy in

¹⁹Ibid.

²⁰Ibid., p. 1.

transcription. All literature reviewed agreed that shorthand was an advantage to all students who enrolled in the course and who applied themselves in learning the skill for vocational use.

The reason why employers have placed shorthand as an important phase of the office work is because they realize shorthand's greatest advantages and purposes--Shorthand adds speed and saves time. Speed has always been important to good businessmen, and it will continue to be an important factor. Speed, accuracy, and time saved mean money saved for the businessman.

Shorthand is determined to be a vocational skill. Teachers, therefore, must help their students prepare to meet the needs of business as it is today and as it will be in the immediate future. This means that teachers must prepare their students to take dictation in shorthand at a rate of at least eighty words a minute. The teaching, however, must not stop here. The student must work with typewriting, grammar, punctuation, and the many other abilities and skills which prepare him to be an efficient transcriber of shorthand notes taken.

Most students of shorthand will spend at least two years in high school training before they will reach a level of competency placing them in an employable position as a secretary or a stenographer. At this time they should be vocationally prepared with adequate job entry abilities to place them on a job where they can further prove themselves and take advantage of opportunities offered them in today's modern world of business.

CHAPTER III
METHODS AND PROCEDURES

The methods and procedures used in conducting this study are divided into four main sections: (1) procedures used in selection of groups to be tested, (2) procedures used for testing, (3) procedures used for evaluating tests, and (4) summary of chapter.

Procedures used in selection of groups to be tested

A letter and questionnaire (See Appendixes A and B, pp. 64-67 for copies of the letter and questionnaire.) were sent to each shorthand instructor in the state of Utah high schools to ascertain the instructors' willingness to participate in this study by giving their students a Civil Service shorthand test. The results from the letter and questionnaire sent to each of the 112 shorthand instructors in the Utah high schools were used in selecting the population for this study. The results for teacher-questionnaire returns are shown in Table 1.

Table 1. Number and percentage of responses to teacher questionnaires

	Number of Questionnaires Returned	Percentage of Questionnaires Returned
Number of "Yes" Responses	72	64.3
Number of "No" Responses	10	8.9
Questionnaires Received After Deadline Date	<u>2</u>	<u>1.8</u>
TOTAL	84	75.0

Of the 112 questionnaires sent to high school teachers, 84 were returned. This amounted to a 75 per cent return on the questionnaires sent for reply. Seventy-two of the teachers returning questionnaires indicated that they would administer the test to their shorthand students. This amounted to 64.3 per cent of the teachers responding in the affirmative. According to the questionnaires returned, these teachers had a total of 3,458 students in their shorthand classes.

All students who registered for classes involving first- or second-year shorthand under these 72 shorthand instructors in Utah's high school were the possible subjects for the study. All were students of Gregg Shorthand, Diamond Jubilee Series. Some of the teachers who previously indicated their willingness to give the test were unable to give it so late in the school year. Table 2 shows the number and percentage of teachers who administered the test and returned the test answer sheets.

Table 2. Number and percentage of teachers returning test answer sheets

	Number of Teachers Returning Tests	Percentage of Teachers Returning Tests
Teachers Who Gave the Test	66	91.7
Teachers Who Did Not Give the Test	<u>6</u>	<u>8.3</u>
TOTAL	72	100.0

Of the 3,458 tests sent to the 72 instructors, 352 tests were sent to the six instructors who did not administer and return any

completed tests. Some of the 66 teachers involved in the testing elected not to give the test to all of their classes. Conflicts arising from year-end school activities presented some problems, which prevented some instructors from giving the test to all of their shorthand classes. Table 3 shows the number and percentage of students who took the test and whose test results were returned in comparison to the 3,458 test blanks sent to instructors to be administered.

Table 3. Number and percentage of students in test-return results

	Number of Student Tests	Percentage of Student Tests
Tests sent to Six Teachers Not Returning Completed Test Results	351	10.2
Classes and Absent Students Not Given The Test Sent to Their Instructors	771	22.3
Invalid Test Results Not Usable Returned	39	1.1
Usable Test Results	<u>2,297</u>	<u>66.4</u>
TOTAL	3,458	100.0

The test was only given once to each class during the week of May 13 through May 17, so any absent students the day of the test were not tested. Two thousand three hundred thirty-six students took the complete test and returned their answer sheets. (See Appendix I, p. 86 for schools where the test was administered and the teachers who actually participated in the testing.)

Of the 2,336 test answer sheets returned, 39 did not have the identification information completed and, therefore, could not be used in the findings of this study. The usable returns amounted to 66.42 per cent (2,297 tests) of the 3,458 tests sent to all 72 instructors who originally indicated that they would give the test.

Procedures used for testing

The dictation test used for testing the students was the sample U. S. Civil Service Test taken from the "Stenographers, Typist, Clerk, and Office Machine Operator" booklet.¹ (See Appendixes D, E, F, G, and H, pp. 70-85, for a copy of the test.) The actual test used for dictation was three minutes in length and was dictated at 80 actual words per minute, regardless of word length. The test and all verbal instructions for timing each part of the test were taped and sent to each instructor agreeing to give the test. A letter and written instructions were also sent to the teachers giving them instruction for aiding the students in filling in identifying material on the students' answer sheets. (See Appendixes C and D, pp. 68 - 73 , for instruction to the teachers.) The identifying material included was set up to evaluate the students' status in the following areas: (1) results from shorthand training experience, (2) results from typewriters being used in connection with shorthand training in class, (3) results from

¹Commission's Personnel Measurement Research and Development Center, United States Civil Service Commission, Stenographer, Typist, Clerk, and Office Machine Operator, What It Is, and How It Is Given (1964 Edition, Washington, D. C.: U. S. Government Printing Office, 1964), pp. 43-50.

different grade levels in school, (4) results from the number of students enrolled in the shorthand class, (5) results from length of class periods in minutes, and (6) results from identification of school as to urban or rural location.

The tape was also accompanied by an instruction sheet for each student, explaining procedures for taking the test; a work sheet for each student, for use in transcribing shorthand notes; and an IBM 1230 document No. 509 answer sheet for each student to use in supplying identification information and final answers to the test. (See Appendixes F, G, and H, pp. 77-85, for copies of instructions, work sheets, and answer sheets.)

Teachers were first instructed to help students fill out all identifying material on the answer sheet according to instructions so the tests could later be grouped and scored. Five minutes were to be allotted for completion of the identifying material. The tape was then to be turned on by the instructor and allowed to run for the full forty minutes without stopping until instructions were given to stop the tape.

The voice on the tape gave the students an allotted amount of time for each part of the test--reading of instructions, actual dictating of the test, transcribing of notes according to provided instructions, and transferring of answers to the IBM answer sheets.

Final instructions given on the tape were for the teacher to gather the IBM answer sheets completed by each student, shut off the tape, and return the tape along with the gathered answer sheets which were then to be evaluated.

Procedures used for evaluating tests

Each completed answer sheet, when returned, was checked carefully to see that the identification section of the sheet had been filled in properly and to see that the answers for the test had been recorded as instructed. Those tests which were marked with pen rather than with pencil as instructed were gone over with pencil so the tests could all be corrected, compared, and evaluated by the 1230 scoring computer. The scores and other identifying information from the answer sheets were then punched into IBM cards to be used in evaluation procedures.

All IBM cards punched with information derived from the test answer sheets were run on the IBM 360 computer at Utah State University to meet the objectives of this study. The two runs used for evaluating these cards were: QUEST for tabulation data and F-ratios, and BASIC for analyses of variances. The results from these computer runs were used to meet the objectives of this study by means of variances and comparisons. The statistical significance level of .05 was used where applicable in making these comparisons. Computer No. 360 runs were made for the following information:

1. Total number taking test.
 - a. Total number of first-year students.
 - b. Total number of second-year students.
2. Number of tests passed at 95 per cent or over.
3. Number of tests passed at 90 per cent to 95 per cent.
4. Number of tests passed at 85 per cent to 90 per cent.
5. Number of tests passed at 80 per cent to 85 per cent.

6. Number of tests passed at 70 per cent to 80 per cent.
7. Number of tests passed at 60 per cent to 70 per cent.
8. Number of tests passed at 50 per cent to 60 per cent.
9. Number of tests with scores below 60 per cent.
10. Number of first-year students passing in each category above.
11. Number of second-year students passing in each category above.
12. Number of rural school, first-year students passing each category above.
13. Number of rural school, second-year students passing in each category above.
14. Number of urban school, first-year students passing in each category above.
15. Number of urban school, second-year students passing in each category above.
16. A comparison of the different teaching programs used in this study to see if a difference of significance is shown by the test scores from the different programs.
17. A comparison of the achievement of first-year shorthand students using typewriters with those who did not use them.
18. A comparison of the achievement of second-year students who used typewriters throughout all shorthand instruction with those who used them only after the first year.
19. A comparison of the achievement of shorthand students in each class-size breakdown listing in the test answer sheet categories.
20. A comparison of the achievement of shorthand students in classes of varying lengths as broken down in test answer sheet categories.

All tests and comparisons made for this study were based on the test scores of the students participating in the shorthand test. This placed all schools and students on an equal basis, as first- and second-year shorthand students' scores were rated separately.

Summary of chapter

All students participating in the test were first- or second-year students of Gregg Shorthand, Diamond Jubilee Series. All students taking the test used the same shorthand system and the tests were all given during the same week, May 13 through May 17, 1968. The test scores were then compared to measure the objectives of the study. The test was given during the fourth quarter of school, near the end of the year, so the students would be near completion of the courses in which they were involved.

Only the students' test results were used in the objectives of the study for measurement comparisons. All comparisons and tests used in the findings of this study were made from the test scores of the individual student answer sheets returned.

The students' test score answer sheets were scored on the No. 1230 scoring machine at Utah State University. Variances and comparisons using all test scores were determined by use of the F-ratio statistical measurement at a statistical significance level of .05. These statistical comparisons were made on the IBM 360 computer at Utah State University as required to meet the objectives of the study.

CHAPTER IV

FINDINGS

The findings of this study are the results of scores and comparisons of those scores on a shorthand test, dictated at 80 words per minute, counting each word regardless of length of the word as one word, given to 2,297 first and second-year shorthand students in the secondary schools in the state of Utah. Of the 2,336 tests administered and returned, 29 lacked the proper identification information needed for comparison purposes and were, therefore, not used in the findings of this study.

The findings of the study are divided into sections as follows: (1) results from test scores by percentage breakdown, showing the number of students passing the test, (2) results from comparison of the different shorthand teaching programs, (3) results from rural school shorthand test score comparisons, (4) results from urban school shorthand test scores comparisons, (5) results from combined rural and urban school shorthand test score comparisons, (6) results from test score comparisons where typewriters were and were not used in first-year shorthand instruction, (7) results from test score comparisons where typewriters were and were not used in second-year shorthand instruction, (8) results from class-size comparisons using test scores, and (9) results from class-length comparisons using test scores.

Results from test scores by percentage breakdown,
showing the number of students passing the test

The maximum score that could be obtained on the test given for this study was 125 points. (See Appendix G, p. 79, for a copy of the test work sheet showing 125 possible selection blanks.) Each of the 2,297 usable test results was checked according to correct responses and was assigned a number score. The scored answer sheets were then separated according to whether the test was taken by a first- or a second-year shorthand student.

As shown in Table 4, the test scores were categorized according to number scores and also percentages for convenience of understanding test results and for test result comparisons.

Table 4. Groupings used in test score breakdown

Grouping	Percentage Score	Test Score Categories
1	0 - 49	0 - 62
2	50 - 59	63 - 74
3	60 - 69	75 - 86
4	70 - 79	87 - 99
5	80 - 84	100 - 105
6	85 - 89	106 - 111
7	90 - 94	112 - 118
8	95 - 100	119 - 125

Special attention will be paid throughout this chapter to those who passed the test at 119 or above; group 8. These are the students who took the dictation and transcribed using their answer sheets with a minimum of 90 per cent accuracy. The other test-score categories are also important and will be considered in the findings of the study even though the tests represented by these groupings were not passed with 95 per cent accuracy.

Table 5 gives a breakdown, using the categories from Table 4, showing the number of first-year shorthand students who scored in each category and the percentage of the 1,684 first-year shorthand students in each category.

Table 5. Number and percentage of first-year students in category breakdown according to student test scores

Test Score Categories	Number of Students In Category	Percentage of Students In Category
0 - 62	1,195	71.0
63 - 74	222	13.1
75 - 86	148	8.7
87 - 99	70	4.1
100 - 105	20	1.1
106 - 111	10	.5
112 - 118	13	.7
119 - 125	<u>6</u>	<u>.4</u>
TOTAL	1,684	99.6 ^a

^aTotal percentage does not equal 100 per cent because of round-off error in computations.

As is shown in Table 5, only .4 per cent of the first-year shorthand students scored at the 95 per cent accuracy level on the test given. Only 39 per cent of the first-year students passed the test with a score above the 50 per cent level.

Table 6 gives a breakdown, using the categories in Table 4, which shows the number of the 613 second-year shorthand students who scored in each category and the percentage in each of the groups.

Table 6. Number and percentage of second-year students in category breakdown according to student test scores

Test Score Categories	Number of Students In Category	Percentage of Students In Category
0 - 62	126	20.5
63 - 74	65	10.6
75 - 86	81	13.2
87 - 99	76	12.3
100 - 105	50	8.1
106 - 111	54	8.8
112 - 118	68	11.0
119 - 125	<u>93</u>	<u>15.1</u>
TOTAL	613	99.6 ^a

^aTotal percentage does not equal 100 per cent because of round-off error in computations.

Second-year students did better on the test than did the first-year students. At the 95 per cent accuracy level, 15.1 per cent of the second-year shorthand students passed the test. Nearly 80

per cent (79.5) of the second-year students passed the test with a score above the 50 per cent level compared with only 39 per cent on the first-year student level of shorthand training. Over one-fourth (26.1 per cent) of all second-year shorthand test scores used in this study were passed at above 90 per cent. Less than 1 per cent of the first-year students passed the test at above 90 per cent.

Table 7 gives a breakdown using the categories in Table 4 and showing the number of 2,297 first-year and second-year shorthand students involved in the testing for this study who scored in each category and the percentage in each of the categories.

Table 7. Number and percentage of combined first- and second-year student breakdown according to student test scores

Test Score Categories	Number of Students In Category	Percentage of Students In Category
0 - 62	1,321	57.6
63 - 74	287	12.5
75 - 86	229	10.0
87 - 99	146	6.3
100 - 105	70	3.0
106 - 111	64	2.8
112 - 118	81	3.5
119 - 125	<u>99</u>	<u>4.3</u>
TOTAL	2,297	100.0

Of all 2,297 students completing the test, only 4.3 per cent passed it at the 95 per cent accuracy level of competency. Less than 10 per cent (7.8) of all students used for the testing for this study passed the test at 90 per cent. Only 13.6 per cent of the tests were passed at 80 per cent and above; and only 42.4 per cent of all tests used in the study were passed at above 50 per cent.

Results from comparison of the different shorthand teaching programs

The different shorthand teaching programs used as a basis for this study were as follows: (1) one year, one-hour shorthand class; (2) two years of one-hour shorthand class instruction; (3) one year of shorthand plus a concentration of shorthand instruction in a block program; (4) one year of two-hour shorthand class instruction; (5) two years of two-hour block instruction; and (6) other. These programs will be compared separately as they apply to either first-year or second-year shorthand students. Table 8 is a comparison of programs one, four, and six as listed above.

Table 8. Summary for analysis of variance between the three shorthand programs involving first-year shorthand students

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F-Ratio
Between Groups	280.12	2	140.06	2.44 ^a
Within Groups	<u>95,858.01</u>	<u>1,670</u>	57.40	
TOTAL	96,138.13	1,672		

^aNot significant, $F_{.05}$ for $df_2, 1,670 = 2.60$

As is shown in Table 8, no significant differences were found in comparing the first-year shorthand students of the different programs at the .05 level of significance requiring an F-ratio of 2.60. This finding shows that no specific teaching program presently being used in teaching shorthand in the Utah high schools is better than any other programs being used on the first-year instruction level.

Table 9 is a comparison of programs two, three, five, and six representing second-year shorthand teaching programs presently being used in the Utah high schools.

Table 9. Summary for analysis of variance between shorthand programs involving second-year shorthand students

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F-Ratio
Between Groups	514.20	3	171.40	1.80 ^a
Within Groups	<u>58,322.44</u>	<u>602</u>	95.22	
TOTAL	58,836.64	605		

^aNot significant, $F_{.05}$ for $df_3, 602 = 2.62$

Table 9 shows that no significant differences were found in second-year shorthand teaching programs. In comparing these programs with each other at the .05 level of significance, an F-ratio of 2.62 is required for the difference to be significant, and the results from this test resulted in an F-ratio of only 1.80.

All teaching programs involved in this study were placed in the five teaching programs represented in the shorthand classes of the Utah high schools, except for two classes (one each) of two different

schools. These two classes belong to group six, labeled "other." One of these schools indicated that shorthand was taught only every other day (two students involved), and the other school indicated that shorthand was taught only three days a week (25 students involved). Only 27 students were involved in these two programs so the numbers were not adequate to affect comparisons, but they were used since they were part of the completed test results returned. Two of these 27 students were second-year shorthand students, and 25 were first-year shorthand students. When the two students' scores on the second-year shorthand level were compared with all other second-year shorthand students as shown in Table 9, there was no significant difference at the .05 level. However, when averaged alone, these two students had an average score of only 76.5, while all other second-year students had an average score of 95.22. The 25 first-year shorthand students of this group, according to Table 8, did as well as the other students in the table at the .05 significance level. However, when averaged alone, they had an average score of only 49.44, while all other first-year shorthand student groupings had an average score of 57.40. The test results of the students of these two schools in the "other" grouping did not show that the students were doing as well as the students being taught under the first five teaching programs listed.

Results from rural school shorthand test score comparisons

Of the students involved in this study, 48 did not clearly indicate whether they were from rural or urban high schools, so the results of this comparison are based on the 2,249 (1,639 first year

and 610 second year) students making the proper identifications on their answer sheets.

Only .1 per cent of all first-year rural students used in this study passed the test at 95 per cent. Fewer than 1 per cent (.7) of the rural, first-year students passed the test at 90 per cent. Over half (69.2) of the students were unable to pass the test at even 50 per cent accuracy. Of the 30.8 per cent rural, high school, first-year shorthand students passing the test at above 50 per cent accuracy, only 2.4 per cent passed the test with 75 per cent accuracy.

Table 10 shows the percentage of the 824 rural, first-year shorthand students who passed the test at the different levels or categories used in this test as broken down in Table 4.

Table 10. Number and percentage of first-year rural school students according to category breakdown

Test Score Categories	Number of Students In Category	Percentage of Students In Category
0 - 62	571	69.2
63 - 74	122	14.8
75 - 86	73	8.8
87 - 99	34	4.1
100 - 105	11	1.3
106 - 111	7	0.8
112 - 118	5	0.6
119 - 125	<u>1</u>	<u>0.1</u>
TOTAL	824	99.7 ^a

^aTotal percentage does not equal 100 per cent because of round-off error in computations

The rural, second-year shorthand students used in this test show much improvement over the first-year, rural school students. Only 11.9 per cent of the second-year students scored at less than 50 per cent. Nearly one fourth, (21.9 per cent) of these students scored at 95 per cent and above. Of the 251 second-year, rural school students, 35.4 per cent scored at 90 per cent or above as compared with only .7 per cent of the first-year students; 64.3 per cent scored at 75 per cent or better as compared to 2.4 per cent of the first-year, rural shorthand students.

Table 11 shows the percentage of the 251 rural, second-year shorthand students who passed the test at the different levels or categories used in this study.

Table 11. Number and percentage of second-year rural school students according to category breakdown

Test Score Categories	Number of Students In Category	Percentage of Students In Category
0 - 62	30	11.9
63 - 74	23	9.1
75 - 86	36	14.3
87 - 99	26	10.3
100 - 105	22	8.7
106 - 111	25	9.9
112 - 118	34	13.5
119 - 125	<u>55</u>	<u>21.9</u>
TOTAL	251	99.6 ^a

^aTotal percentage does not equal 100 per cent because of round-off error in computations

Results from urban school shorthand
test score comparisons

Of the 815 first-year, urban school students used in this study, not a single student passed the test at 95 per cent or higher. Only .9 per cent of these students passed the test at 90 per cent. Nearly three-fourths (72.3 per cent) of the students were unable to pass the test at an accuracy level above 50 per cent. At the 75 per cent level of accuracy, 6.3 per cent of the 815 first-year, urban students managed to pass the test.

Table 12 shows the number of students as well as the percentage of students who passed the test at the different levels of accuracy.

Table 12. Number and percentage of first-year urban school students according to category breakdown

Test Score Categories	Number of Students In Category	Percentage of Students In Category
0 - 62	590	72.3
63 - 74	98	12.0
75 - 86	73	8.9
87 - 99	35	4.2
100 - 105	8	0.9
106 - 111	3	0.3
112 - 118	8	0.9
119 - 125	<u>0</u>	<u>0.0</u>
TOTAL	815	99.5 ^a

^aTotal percentage does not equal 100 per cent because of round-off error in computations.

The 359 second-year, urban school students did much better on the study test than the first-year students did. Of the second-year students, 10.5 per cent passed the test with 95 per cent accuracy or better. At the 90 per cent level of accuracy, 19.9 per cent of the second-year students pass the test compared to only .9 per cent of the first-year students. Only 26.1 per cent of the second-year, urban students failed to pass the test with at least 50 per cent accuracy, while 72.3 per cent of the first-year students failed to pass at this level of accuracy. At the 75 per cent level of accuracy, 49.5 per cent of the second-year students passed the test compared to only 6.3 per cent of the first-year students.

Table 13 shows the number and percentage of second-year shorthand students from the urban schools who passed the test at the different levels of accuracy as shown in Table 4.

Table 13. Number and percentage of second-year urban school students according to category breakdown

Test Score Categories	Number of Students In Category	Percentage of Students In Category
0 - 62	94	26.1
63 - 74	42	11.6
75 - 86	44	12.2
87 - 99	50	13.9
100 - 105	28	7.7
106 - 111	29	8.0
112 - 118	34	9.4
119 - 125	<u>38</u>	<u>10.5</u>
TOTAL	359	99.4 ^a

^aTotal percentage does not equal 100 per cent because of round-off error in computations.

Results from combined rural and urban school
shorthand test score comparisons

The mean averages of the rural and urban school students' scores were computed to determine whether there was a significant variance difference in the two groups at the .05 level of significance. The same test scores and figures shown in Tables 10, page 35, and 12, page 37, were used in calculations provided for the following F-ratio table, Table 14.

Table 14. Summary for analysis of variance between first-year shorthand test scores for urban and rural high schools students

Source of Variation	Sum of Squares	Degree of Freedom	Mean Square	F-Ratio
Between Groups	173.63	1	173.63	3.02 ^a
Within Groups	<u>94,185.00</u>	<u>1,638</u>	57.50	
TOTAL	94,358.63	1,639		

^aNot significant, $F_{.05}$ for $df_1, 1,638 = 3.85$

A comparison of first-year shorthand students in rural and in urban schools does not give a significant difference at the .05 level using the F-ratio. For a significance at the .05 level of significance, an F-ratio of 3.85 is required, which is higher than the 3.02 figured for Table 14.

The scores of 610 second-year shorthand students give a difference of significance using the F-ratio at the .05 level for a difference of variance amounting to 13.62 in comparing urban and rural

schools. This significant difference was determined by use of the figures shown in Tables 11 and 13 as is shown in the F-ratio table, Table 15.

Table 15. Summary for analysis of variance between second-year shorthand test scores for urban and rural high school students

Source of Variation	Sum of Squares	Degree of Freedom	Mean Square	F-Ratio
Between Groups	1,283.51	1	1,283.51	13.62 ^a
Within Groups	<u>57,391.95</u>	<u>609</u>	94.24	
TOTAL	58,675.46	610		

^aSignificant, $F_{.05}$ for $df_1, 609 = 3.86$

Test scores used in this study, as shown in Table 14 and Table 15, show no significant differences in urban and rural school shorthand students at the first-year level, but the scores do show that rural school shorthand students are doing significantly better at the second-year level than are the urban school second-year students.

Results from test score comparisons where typewriters were and were not used in first-year shorthand instruction

Of the 1,647 first-year shorthand students returning answer sheets, 37 did not indicate whether they used typewriters. Of the students making the proper identification, 926 students used typewriters in shorthand instruction and 721 students did not use typewriters in shorthand instruction. Table 16 gives the test score mean of the students in each of these two groups.

Table 16. Number and mean averages of students who used typewriters in first-year shorthand instruction

Group	Number of Students	Test Score Mean Of Group
Used Typewriters	926	50.72
Did Not Use Typewriters	<u>721</u>	46.95
TOTAL	1,647	

A calculated significance of 10.54 was figured using the test scores of the students represented in Table 16. This ratio of 10.54 is significantly different at both the .05 and .01 levels. First-year shorthand students who used typewriters in shorthand instruction during the year, therefore, did significantly better on the shorthand test used for this study than did those students who did not use typewriters as is shown in Table 17.

Table 17. Summary for analysis of variance between first-year shorthand students who used typewriters and those who did not

Source of Variation	Sum of Squares	Degree of Freedom	Mean Square	F-Ratio
Between Groups	574.47	1	574.47	10.54 ^a
Within Groups	<u>89,638.97</u>	<u>1,645</u>	54.49	
TOTAL	90,213.44	1,646		

^aSignificant, $F_{.05}$ for $df_1, 1,645 = 3.85$

^aSignificant, $F_{.01}$ for $df_1, 1,645 = 6.66$

Results from test score comparisons where typewriters were and were not used in second-year shorthand instruction

Of the 341 second-year shorthand students (272 second-year students did not make any identification as to the use of typewriters) used in this study for typewriter-use comparisons, 220 used typewriters both years of instruction and 121 used typewriters only the second year of shorthand instruction. The test score mean of these two groups is given in Table 18.

A calculated value of 12.68 was computed from the figures in Table 18. This gives a significant F-ratio difference in variance at the .05 and also at the .01 levels of significance as is shown in Table 19.

Table 18. Number and mean score of second-year students and their use of typewriters

Group	Number of Students	Test Score Mean of Group
Used Typewriters Both Years of Instruction	220	86.37
Used Typewriters Only Second Year of Instruction	<u>121</u>	97.26
TOTAL	341	

Table 19. Summary for analysis of variance between second-year shorthand students who used typewriters and those who did not

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F-Ratio
Between Groups	924.68	1	924.68	12.68 ^a
Within Groups	<u>24,727.66</u>	<u>339</u>	72.94	
TOTAL	25,652.34	340		

^aSignificant, $F_{.05}$ for df_1 , 339 = 3.86

^aSignificant, $F_{.05}$ for df_1 , 339 = 6.70

Second-year shorthand students who used typewriters only the second year of shorthand instruction did significantly better than those students who used typewriters both years of instruction. Only 55.6 per cent of the 613 second-year shorthand students indicated whether they used typewriters. If the other 44.4 per cent of the second-year students had indicated their use of typewriters, the results might have been different than they are shown here. This large percentage of students not being used in this finding might have caused the inconsistency between first- and second-year shorthand students and their use of the typewriter findings.

Results from class-size comparisons using test scores

Included in this study was a question concerning the number of students in each of the classes where shorthand was taught in the Utah high schools. Students were asked to indicate the number of

students in their present shorthand class. Table 20 shows the sizes of classes recognized in this study ranging from a class size of 0 to 5 students up to the class size of 40 and above students.

Table 20. Mean scores achieved and number of students in each of the different first-year shorthand class sizes used in this study

Student Class Size Breakdown	Number of Students in Class Size	Mean Scores Of Group
0 - 5	12	38.1
6 - 10	41	46.6
11 - 15	110	46.1
16 - 20	227	46.7
21 - 25	361	51.7
26 - 30	569	48.0
31 - 35	246	52.0
36 - 40	37	46.7
40 and above	<u>42</u>	55.2
TOTAL	1,645	

The number of students shown in the center column of Table 20 represents all first-year students who took the test for this study and who indicated the number of students in their shorthand class on the test answer sheet. This indication was not made by 39 of the first-year students who took the test.

The calculated F-ratio for the information given in Table 20 is shown in Table 21 at the .05 significance level as 1.95.

Table 21. Summary for analysis of variance between first-year shorthand student test scores for different class sizes

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F-Ratio
Between Groups	1,071.16	8	133.90	2.47 ^a
Within Groups	<u>88,827.12</u>	<u>1,636</u>	54.30	
TOTAL	89,898.28	1,644		

^aSignificant, $F_{.05}$ for $df_8, 1,636 = 1.95$

A definite significance of 2.47 was found to exist between the test scores of first-year shorthand students in the different class sizes. The Tukey statistical test was used as a comparison test between class-size groups to find the group mean scores that are significantly better than other mean scores within the F-ratio test comparison at the .05 significance level.¹ This test is made by computing a difference, which is significant at the 5 per cent level, then comparing it with the sample differences in the experiment or comparisons of F-ratio statistic being used. ($D=Qs\bar{X}$). The number of students in the smallest class-size group is used in this test comparison being different each time a different group is the smallest group used in the remaining comparisons of the groups as long as the

¹Snedecor, George W., *Statistical Methods*, (5th Ed.; Ames, Iowa: The Iowa State College Press, 1956), p. 251.

group contains 1 per cent of the total students in the over-all comparisons. The comparisons made to find which groups in Table 20 are significantly better than other groups by class size are shown in Table 22.

Table 22. Comparisons made between first-year shorthand student class-size groups to find significance between groups

Group Size	Mean Score	Mean -38.1	Mean -46.1	Mean -46.6	Mean -46.7	Mean -48.0	Mean -41.7	Mean -52.0
40 and Above	55.2	17.1	9.1	8.6	8.5	7.2	<u>3.5</u>	3.2
31 - 35	52.0	13.9	5.9	5.4	5.3	4.0	.3	
21 - 25	51.7	13.6	<u>5.6</u>	<u>5.1</u>	<u>5.0</u>	<u>3.7</u>		
26 - 30	48.0	9.9	1.9	1.4	1.3			
36 - 40	46.7	8.6	.6	.1	.0			
16 - 20	46.7	8.6	.6	.1				
6 - 10	46.6	8.5	.5					
11 - 15	46.1	<u>8.0</u>						
0 - 5	38.1							

As is shown in Table 22, the 0 - 5 group is significantly poorer than every other class-size group used in the comparison. The 11 - 15, 6 - 10, 16 - 20, 36 - 40, and the 26 - 30 groups are all significantly poorer, according to their mean scores, than the 21 - 25, 31 - 35, and the 40 and above groups; and are also significantly better than 0 - 5 group.

The 21 - 25 group is significantly poorer than the 40 and above group, but is neither significantly better or significantly poorer than the 31 - 35 group. The 40 and above class-size group is significantly better than all groups used in the comparisons except the 31 - 35 group, but is neither significantly better or poorer than this group at the .05 level of significance.

Of the second-year shorthand students, 612 provided adequate, clear information for use in the comparison of class sizes. This means that only one second-year student did not provide the information asked for in this comparison. The number of students in each class-size breakdown and the mean scores of the different groups are given in Table 23.

Table 23. Mean scores achieved and number of students in different second-year shorthand class sizes

Student Class Size Breakdown	Number of Students	Mean Scores Of Group
0 - 5	7	71.3
6 - 10	52	77.2
11 - 15	78	78.9
16 - 20	116	91.6
21 - 25	202	91.6
26 - 30	128	94.1
31 - 35	27	66.3
36 - 40	1	80.0
41 and above	<u>1</u>	69.0
TOTAL	612	

The number of students in the last two groups in Table 23 are not sufficiently large to have an effect on the class-size comparisons. These two students involved in the last two groups apparently made improper indications on their answer sheets as to class size. Otherwise, there should have been more students in these two group sizes. Therefore, these two students were not used in second-year shorthand student class-size comparisons. The calculated significance at the .05 level for the group comparisons is 1.96. This information is shown in Table 24.

Table 24. Summary for analysis of variance between second-year shorthand student test scores for different class sizes

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F-Ratio
Between Groups	3,655.54	8	456.94	6.16 ^a
Within Groups	<u>44,722.71</u>	<u>603</u>	74.17	
TOTAL	48,378.25	611		

^aSignificant, $F_{.05}$ for df_8 , 603 = 1.96

The F-ratio significance of 6.16 was found in comparing all second-year students by class size. These class sizes were broken down further and ranged according to group means to find significance between groups as is shown in Table 25.

The Tukey statistical test was again used to make the comparisons between groups used in the F-ratio test for second-year students of shorthand for determining which class sizes were significantly better at the .05 level than other class sizes.

Table 25. Comparisons made between second-year shorthand student class size groups to find significance between groups

Group Size	Mean Score	Mean -66.3	Mean -71.3	Mean -77.2	Mean -78.9	Mean -91.6	Mean -91.6
26 - 30	94.1	27.8	22.8	16.9	15.2	2.5	2.5
21 - 25	91.6	25.3	20.3	14.4	12.7	.0	
16 - 20	91.6	25.3	20.3	<u>14.4</u>	<u>12.7</u>		
11 - 15	78.9	12.6	7.6	1.7			
6 - 10	77.2	10.9	<u>5.9</u>				
0 - 5	71.3	<u>5.0</u>					
31 - 25	66.3						

With regard to the seven groups compared in Table 25, the 31 - 35 class-size group is sufficiently poorer than any and all of the other groups to label it the poorest grouping of the choices presented in the table. The choices presented in the standard class-size breakdown column of Table 23 are the class sizes presently used for second-year shorthand in the state of Utah. In comparing the 31 - 35 group with the best group, 26 - 30, a calculated 6.16 F-ratio shows it to be definitely poorer than the significant 1.96 at the .05 level as is indicated in Table 24. The 0 - 5 group is sufficiently poorer than all other class-size groups shown in Table 25 except the 31 - 35 group. The 6 - 10 and the 11 - 15 groups are neither sufficiently poorer nor sufficiently better than each other. They are, however, poorer than the 16 - 20, 21 - 25, and 26 - 30 groups. The other three groups,

16 - 20, 21 - 25, and 26 - 30, though not significantly different when compared among themselves, are significantly better than the other groups used in the comparison at the .05 level of significance.

The fourth (16 - 20), fifth (21 - 25), and sixth (26 - 30) groups of shorthand students listed in Table 23 are not only the best groups for class sizes as shown by scores for this study and as shown by the Tukey test in Table 25, but they are also the most frequent class sizes in Utah high schools for second-year shorthand as indicated by the number of students used in this study.

Results from class-length comparisons
using test scores

The different length class periods used for teaching first-year shorthand to 1,640 students in the state of Utah were compared to see what effect they had on shorthand instruction. There were 44 first-year students who did not indicate the class period length in which they were taught and are therefore not used in this section of the study. Table 26 gives the number of first-year shorthand students who were taught in each of the different class period lengths used for shorthand instruction in the state of Utah high schools.

Table 26. First-year shorthand mean scores achieved and number of students in different length class periods

Class Length In Minutes	Number of Students	Mean Scores of Groups
40	5	50.8
45	53	46.6
50	1,022	48.6
55	389	54.8
60	<u>171</u>	40.6
TOTAL	1,640	

The 40-minute class period does not have sufficient students for a reliable test and showed no effect on the figures in Table 27.

Table 27. Summary for analysis of variance between first-year shorthand student test scores for different class lengths

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F-Ratio
Between Groups	2,544.13	4	636.03	11.97 ^a
Within Groups	<u>86,861.95</u>	<u>1,635</u>	53.13	
TOTAL	89,406.08	1,639		

^aSignificant, $F_{.05}$ for $df_4, 1,635 = 2.38$

At the .05 level of significance, a calculated F-ratio of 2.38 is necessary for a comparison difference to exist in the figures given in Table 26. The Tukey statistical test was used to make

comparisons between the different class-length groups used by first-year shorthand students in learning shorthand to find which length class periods were significantly better at the .05 level than other class length periods. The comparisons made are shown in Table 28.

Table 28. Comparisons made between first-year shorthand student length class periods to find significance between groups

Group Size	Mean Score	Mean -40.6	Mean -46.6	Mean -48.6	Mean -50.8
55	54.8	14.2	8.2	<u>6.2</u>	<u>4.0</u>
40	50.8	10.2	<u>4.2</u>	2.2	
50	48.6	8.0	2.0		
45	46.6	<u>6.0</u>			
60	40.6				

The 60-minute class length period is significantly poorer than the other five class length periods used in this comparison to label it the poorest group in the comparison. The 45- and 50-minute class length periods are neither sufficiently poorer or sufficiently better than each other, but both are poorer than the 40- and 55-minute class length periods. The 40-minute class period is poorer than the 55-minute and better than the 45-, 50-, and 60-minute class length periods. The 55-minute class length period is sufficiently better than the other groups at the .05 level of significance to make it the best length class period for teaching shorthand to first-year shorthand students. These comparisons were made as shown in Table 28 by use of the Tukey statistical test for comparison between groups.

Seven second-year shorthand students did not indicate their class period length. Of the 606 second-year students responding to the class-length identification on their test answer sheets, only three class lengths, the 50-, 55-, and 60-minute classes, are represented as being used in Utah high schools for teaching second-year shorthand classes. These are shown in Table 29. The number of students in each of these class sizes is also given in Table 29.

Table 29. Second-year shorthand mean scores achieved and number of students in different length class periods

Class Length In Minutes	Number of Students	Mean Scores Of Groups
50	377	86.0
55	193	94.1
60	<u>36</u>	76.1
TOTAL	606	

At the .05 level for the F-ratio, a calculated F of 3.02 is necessary for significance in comparison of class lengths used in Table 29. This is shown, as calculated, in Table 30.

Table 30. Summary for analysis of variance between second-year shorthand student test scores for different class lengths

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square	F-Ratio
Between Groups	1,391.96	2	695.98	9.03 ^a
Within Groups	<u>46,485.62</u>	<u>603</u>	77.09	
TOTAL	47,877.58	605		

^aSignificant, $F_{.05}$ for $df_2, 603 = 3.02$

The Tukey statistical test for comparison between groups shows the 55-minute class length group to be significantly better, as shown by the Civil Service Shorthand test given, than both the 50- and the 60-minute groups at the .05 level of significance. The 50-minute group, although significantly poorer than the 55-minute group, is significantly better than the 60-minute class length group. The 60-minute class length group, according to the student scores in this group, is significantly poorer than both of the other groups in this second-year shorthand student class length comparison.

Both the first- and second-year student test scores indicate that the 55-minute class period is the best class length to be used in shorthand instruction. The 50- and 55-minute class periods are the most frequently used class-period lengths for shorthand class instruction in the Utah high schools.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

Students who registered for first- and second-year shorthand in the high schools in Utah during the 1967-68 academic year were the participants in this investigation. Of the 112 shorthand instructors in the state of Utah high schools, 66 instructors from 51 different schools gave the test for this study to their students. Of the students taking the test, 2,297 filled the answer sheets out properly and were used for this study.

All tests and comparisons made for this study were based on the test scores of the students participating in the shorthand test. This placed all schools and students on an equal basis as first- and second-year shorthand students' scores were rated separately.

All shorthand students, both first-year and second-year, used in this test were taught Gregg Shorthand, Diamond Jubilee Series. They were all tested during the same week of the school year. The results of this test were used in comparison evaluations, which provided the following summary of findings:

1. Only six first-year shorthand students (.4 per cent) and 93 second-year shorthand student (15.1 per cent) for a total of 99 (4.31 per cent) students in the whole tested population achieved the 95 per cent accuracy on the 80 words per minute dictation test material.

2. There was no significant difference in the students' performance in any of the five different teaching programs compared in this study as measured by the test results used in the study.

3. Test scores used in this study show no significant differences in urban and in rural school shorthand student learning at the first year level, but does show that rural school shorthand students are doing significantly better at the second-year shorthand level than are the urban school shorthand students.

4. First-year shorthand students who used typewriters in shorthand instruction did significantly better on the shorthand test than those students who did not use typewriters.

5. Second-year shorthand students who used typewriters only the second year of shorthand instruction did significantly better on the shorthand test than those students who used typewriters both years of instruction. This finding may have been influenced by the fact that 44.4 per cent of the second-year shorthand students did not indicate their use of the typewriter and were, therefore, not used in the comparison.

6. First-year shorthand students did significantly better in shorthand training in class sizes of 21 - 25, 31 - 35, and 40 and above students.

7. Second-year shorthand students did significantly better on the shorthand test in classes with 16 or more students, but not more than 30 students.

8. All students of shorthand, both first and second year, did significantly better on the shorthand test in classes that were 55 minutes in length. The 50- and 55-minute classes are the most popular class lengths used in Utah high schools for shorthand instruction.

Conclusions

Specifically, each of the following are conclusions reached as a result of this study:

1. The majority of first-year and second-year shorthand students in Utah high schools need additional training to reach a level of vocational competency in the use of shorthand skills.

2. The five programs of shorthand instruction used in Utah high schools are all doing about equally well in training shorthand students for preparing the students for vocational employment.

3. The location of Utah high schools, urban or rural, has little or no effect on the learning progress of first-year shorthand students.

4. Second-year shorthand students do significantly better in learning shorthand skills in rural Utah high schools than those second-year shorthand students in urban Utah high schools.

5. The use of typewriters is a valuable aid in the learning of shorthand skills for first-year shorthand students.

6. Students who take two years of shorthand in Utah high schools do better if typewriters are used only during the second year of shorthand instruction rather than if typewriters are used both years of instruction. This conclusion may be influenced by the fact that 44.4 per cent of the second-year shorthand students did not indicate their use of the typewriter and were, therefore, not used in the comparisons of the study.

7. First-year shorthand students are better prepared in classes involving from 21 to 25, from 31 to 35, and 40 and above students.

8. Second-year shorthand students are better prepared in classes involving not fewer than sixteen students and not more than thirty students than they are in the smaller or larger classes.

9. The most effective class length for teaching shorthand in Utah high schools is 55 minutes long.

Recommendations

Based on the above conclusions, the following recommendations are made:

1. At least two years of shorthand should be made available to students in Utah high schools if they are to gain vocational competency in using the skill.

2. Students taking first-year shorthand should be encouraged to take second-year shorthand in Utah high schools, especially if they are taking the class for vocational purposes.

3. A similar study should be made in Utah high schools allowing students to transcribe their notes at the typewriter. This would allow the students to demonstrate typewriting, punctuation, and other skills, as well as the shorthand writing skill, so that students' competency in these related skills could be determined.

4. A study should be made in Utah high schools to see why second-year shorthand students do better in rural schools than in urban schools in shorthand preparation.

5. A study should be made in selected shorthand classes to evaluate typed transcripts to see if the students taught under the different programs of teaching explained in this study are doing equally well not only in shorthand but also in the transcription skills.

6. A study should be made in the Utah high schools to determine the amount of time first-year shorthand students should spend in using typewriters in the instructional processes in shorthand classes.

7. A study should be made in Utah high schools to determine the amount of time second-year shorthand students should spend in using typewriters as a teaching aid in shorthand classes.

8. A further study should be made in Utah high schools to determine the effect which the number of students in a class has on the learning of shorthand at both the first- and second-year levels of shorthand instruction.

9. A further study should be made in Utah high schools to determine the effect which the length of class periods has on the learning of shorthand at both the first- and second-year levels of shorthand instruction.

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APPENDIXES

Appendix A

Letter to All Shorthand Instructors in Utah High Schools

U T A H S T A T E U N I V E R S I T Y

DARYL CHASE, PRESIDENT

LOGAN, UTAH, 84321

COLLEGE OF BUSINESS AND SOCIAL SCIENCES
ROBERT P. COLLIER, DEAN
DEPARTMENT OF BUSINESS EDUCATION
AND OFFICE ADMINISTRATION

April 26, 1968

Dear Shorthand Instructor:

Are your students gaining a competency level skill in shorthand that will meet the requirements of business when they leave high school? Have you ever wondered how students over the state are measuring up in vocational shorthand skill competency?

"An Evaluation of Vocational Shorthand Competency Attained In Utah High Schools" is a study that is being undertaken as a master's thesis at Utah State University. This study is being done in conjunction with the Utah State Department of Vocational Education.

The results of this study will be based on an unpracticed 3-minute shorthand test similar to those given by the Federal Civil Service to be given in high schools throughout the state of Utah.

The success of this study depends on the co-operation given by the shorthand instructors in the Utah high schools. Please fill out and return by May 6 the enclosed questionnaire in the stamped and addressed envelope provided.

Sincerely yours,

/s/ Alden A. Talbot

Alden A. Talbot

/s/ E. Charles Parker

Charles Parker
State Specialist
Business and Office Education

Enclosures (2)

Appendix B
Questionnaire to All Shorthand Instructors
in Utah High Schools

QUESTIONNAIRE

1. Do you teach shorthand? Yes _____ No. _____
If your answer is "No", skip items No. 2, No. 3, and No. 4; complete item No. 5 and return the questionnaire in the envelope provided.
2. Length of your school class periods in minutes. 45 ___ 50 ___ 55 ___ 60 ___
3. Program of shorthand classes and enrollment:

(Specify number of classes of each type being taught and combined enrollment in each type.)

	<u>No. of Classes</u>	<u>No. of Students</u>
A. One-hour, first-year shorthand class.	_____	_____
B. One-hour, second-year shorthand class.	_____	_____
C. Two-hour block, first-year shorthand class.	_____	_____
D. Two-hour block, second-year shorthand class.	_____	_____
E. Other, (please specify).	_____	_____

4. Will you administer a test, taking one class period any day during the week of May 13 if the test tape, instructions, and answer forms are sent to you? YOU WILL NOT BE REQUIRED TO CORRECT THE TEST.

YES _____ NO _____

5. Name: _____

School Name and Address: _____

Appendix C

Letter to Instructors Agreeing to Administer

The Shorthand Test

UTAH STATE UNIVERSITY

DARYL CHASE, PRESIDENT

LOGAN, UTAH, 84321

COLLEGE OF BUSINESS AND SOCIAL SCIENCES
ROBERT P. COLLIER, DEAN
DEPARTMENT OF BUSINESS EDUCATION
AND OFFICE ADMINISTRATION

May 9, 1968

Dear Shorthand Instructor:

Thank you for completing and returning the questionnaire for my master's thesis research.

Enclosed are the instructions for administering the shorthand test, answer sheets for the students, the taped test to be given for shorthand, Exhibit No. 1 for the students, and an addressed envelope to be used in returning the answer sheets filled out by the students and the taped test to me. Will you please see that the students have a soft-lead pencil to be used on the answer sheet of this test if at all possible.

The test may be given any day during the week of May 13 through May 17. It will take about 45 minutes to complete this test. Students may use a regular shorthand notebook for taking the dictation for the test.

You may want to read questions 1 through 5 of the instructions before time for giving the test so you can have answers ready to help the students and save time on this part of the test.

Thank you again for being so very helpful in this study. Without your help it could not be completed.

Yours truly,

/s/ Alden A. Talbot

Alden A. Talbot

Enclosures

Appendix D

Instructions to Teachers Giving Test

INSTRUCTIONS

Steps one (1) through five (5) should not take more than five (5) minutes.

1. Please do not practice the dictation material in any way.
2. Check to see that all students have a soft-lead pencil if at all possible.
3. Pass to the students the answer sheets printed in red.
(Note that the answer sheet is numbered across the sheet rather than down.)

Do not fill in identification material at the top of the answer sheet.

4. Pass to the students the instructions and transcript entitled Exhibit No. 1.
5. Go over the following supplementary material to be filled in by the students with those students participating in the test.

- A. Experience in shorthand training: (Length of class period)
If the student is a second-year shorthand student, have him mark both answers No. 141 and No. 142 on the answer sheet as follows. If a first-year shorthand student, have him mark only No. 141 leaving No. 142 blank.

First year: Mark on answer sheet under No. 141.
One-hour class, blacken blank 1 under No. 141.
Two-hour class, blacken blank 2 under No. 141.
Other, blacken blank 3 under No. 141.

Second year: Mark on answer sheet under No. 142.
One-hour class, blacken blank 1 under No. 142.
Two-hour class, blacken blank 2 under No. 142.
Other, blacken blank 3 under No. 142.

- B. Were typewriters used in connection with shorthand training in class? Have second-year students answer both No. 143 and No. 144 as follows. Have first-year shorthand students answer No. 143 leaving No. 144 blank on the answer sheet.

First year: Mark on answer sheet under No. 143.
If typewriters were used, blacken blank 1 under No. 143.
If typewriters were not used, blacken blank 2.
If typewriters were used only occasionally, blacken blank 3.

Second year: Mark on answer sheet under No. 144.
If typewriters were used, blacken blank 1 under No. 144.
If typewriters were not used, blacken blank 2.
If typewriters were used only occasionally, blacken blank 3.

Teacher Instructions (Continued)

- C. Grade level in school you are just completing:
Mark on answer sheet under No. 145.

If a Senior, blacken blank 1 under No. 145.
If a Junior, blacken blank 2.
If a Sophomore, blacken blank 3.
If a Freshman, blacken blank 4.

- D. Number of students enrolled in your shorthand class:
Mark on answer sheet under No. 146 and No. 147.

If fewer than 5 students, blacken blank 1 under No. 146.
If 6 to 10 students, blacken blank 2 under No. 146.
If 11 to 15 students, blacken blank 3 under No. 146.
If 16 to 20 students, blacken blank 4 under No. 146.
If 21 to 25 students, blacken blank 5 under No. 146.
If 26 to 30 students, blacken blank 1 under No. 147.
If 31 to 35 students, blacken blank 2 under No. 147.
If 36 to 40 students, blacken blank 3 under No. 147.
If over 40 students, blacken blank 4 under No. 147.

- E. Length of class periods in minutes:
Mark on answer sheet under No. 148.

40-minute class, blacken blank 1.
45-minute class, blacken blank 2.
50-minute class, blacken blank 3.
55-minute class, blacken blank 4.
60-minute class, blacken blank 5.

- F. Urban or Rural School:
Mark on answer sheet under No. 149.

Urban includes schools in Salt Lake City area, Ogden City, Provo City, and Logan City. All other are Rural Schools.

If your school is in one of the urban areas, blacken blank 1 under No. 149.
If your school is in a rural area, blacken blank 2 under answer No. 149.

Steps six (6) through eight (8) take 40 minutes.

6. Now we are ready to take the test. Students may take the test in a regular shorthand notebook.

Start the tape for the test. The tape is timed and has instructions for performing the test. Please do not stop the tape until the test is completed and you are asked to do so.

Teacher Instructions (Continued)

7. When instructed to stop the tape, please do so.
Should be 40 minutes from when you started it.
8. Collect answer sheets from students.
This completes the test.
9. Exhibit No. 1 does not need to be returned with the tape and the answer sheets.
10. Return answer sheets and the tape used for the test in the envelope provided.

Appendix E

Copy of Three-Minute Dictated Test Material

THREE-MINUTE DICTATION MATERIAL

The number enrolled in shorthand classes in the high schools has shown a marked increase.(Period)	10
Today this subject is one of the most popular offered in the field of	20
business education.(Period) When shorthand was first taught, educators claimed that it was of	30
value mainly in sharpening the powers of observation and discrimination.(Period)	40
However, with the growth of business and the increased demand for office workers,	50
educators have come to realize the importance of stenography as a vocational	1 min.
tool.(Period) With the differences in the aims of instruction came changes in	10
the grade placement of the subject.(Period) The prevailing thought has always been that it	20
should be offered in high school.(Period) When the junior high school first came into	30
being, shorthand was moved down to that level with little change in the manner in which	40
the subject was taught.(Period) It was soon realized that shorthand had no place there	50
because the training had lost its vocational utility by the time the student could	2 min.
graduate.(Period) Moreover, surveys of those with education only through junior	10
high school seldom found them at work as stenographers.(Period) For this reason, shorthand	20
was returned to the high school level and is offered as near as possible to the time	30

of graduation so that the skill will be retained when the student takes a job.(Period)	40
Because the age at which students enter office jobs has advanced, there is now	50
a tendency to upgrade business education into the junior college.(Period) ¹	3 min.

(Finish reading each two lines at the number of seconds indicated to the right of the dictation material.)

¹Commission's Personnel Measurement Research and Development Center, United States Civil Service Commission, Stenographer, Typist, Clerk, and Office Machine Operator. What It Is, and How It Is Given, (1964 Edition, Washington, D. C.: U. S. Government Printing Office, 1964), p. 44.

Appendix F

Instructions to Students Taking Test

EXHIBIT NO. 1 TRANSCRIPT--DICTATION TEST

Directions for Completing the Transcript:

A TRANSCRIPT of the dictation you have just taken is given on page 2 and 3 with some of the words missing. There are numbered blank spaces for many of the words that were dictated. Compare your notes with the TRANSCRIPT and, when you come to a blank in the TRANSCRIPT, decide what word (or words) belongs there. You are to compare your notes with the TRANSCRIPT AND, when you come to a blank, decide what word (or words) from the WORD LIST belongs there. For most of the blanks the words are included in the list beside the TRANSCRIPT; each is followed by a number, 1, 2, 3, or 4. To show that you know which word (or words) belongs in each blank space, you are to write its number in the blank in the TRANSCRIPT. You are to write 5 if the exact answer is NOT listed. (In addition you may write the word or words or the shorthand for them, if you wish.) The same choice may belong in more than one blank.

After you have compared your notes with the TRANSCRIPT and have chosen the answer for each blank space, you will be given additional time to transfer your answers to a separate answer sheet.

Do not go on until directed to do so.

Directions for Marking the Separate Answer Sheet:

On the answer sheet, each number stands for the blank with the same number in the TRANSCRIPT (1 through 125). You are to blacken the space between the dotted lines beside the number that is the same as the number you wrote in the TRANSCRIPT.

Work quickly so that you will be able to finish in the time allowed. First you should blacken the spaces on the answer sheet for the blanks you have numbered. If you have not finished writing letters in the blanks in the TRANSCRIPT, or if you wish to make sure that you have numbered them correctly, you may continue to use your notes.

Be accurate, because your rating will depend on the spaces you blacken on your answer sheet; the numbers you write on the work sheet will not be scored. If you have to change your answer on the answer sheet for any question, be sure to erase the first mark completely (do not merely cross it out) before making another.

If you finish before time is called, look over your answer sheet to be sure you have blackened the spaces you intended to blacken.

DO NOT OPEN THIS BOOKLET UNTIL TOLD TO DO SO

Appendix G

Transcript Work Sheets for Students Taking

The Shorthand Test

WORD LIST

Write 5 if the answer is NOT listed.

administration-3 observation-2
 along the-2 observing-1
 area-1 offered-3
 at first-1 of value-3
 claimed-3 open-1
 classes-2 popular-2
 concluded-4 power-2
 could be-4 powers-4
 courses-3 practical-1
 decrease-4 shaping-1
 discriminating-3 sharpen-2
 discrimination-4 shorthand-4
 education-2 shown-3
 enrolled-4 stenography-2
 entering-1 study-3
 field-4 subject-1
 first-4 taught-4
 given-2 that-3
 great-3 the-4
 increase-1 these-2
 in the-4 this-1
 known-4 thought-2
 line-3 to be-1
 mainly-2 training-4
 marked-2 valuable-1
 mostly-4 vast-1

TRANSCRIPT

The number 1 in shorthand
2 3 high schools has 4 a
5 6. Today 7 8 is
 one of the most 9 10 11
12 of business 13. When 14
15 16 17, educators 18
 that it 19 20 21 in 22
23 24 of 25 and 26 . . .

Write 5 if the answer is NOT listed.

a change-4 offered-3
 administration-3 office-1
 aims-1 official-3
 always been-1 often been-2
 begun-4 ought to be-2
 businesses-1 place-2
 came-4 placement-4
 changes-2 prevailing-2
 come-3 rule-4
 defects-2 schools-4
 demands-1 shorthand-4
 differences-4 should be-1
 education-2 significance-3
 educators-4 stenography-2
 for-4 study-3
 given-2 subject-1
 grade-3 thinking-3
 grading-2 this-1
 has-3 thought-2

. . . However, 27 the growth of
28 and the 29 30 for 31
32, 33 have 34 35 the
36 of 37 38 a 39 40.
 With the 41 in the 42 of 43

had-2
 have come-1
 high school-2
 increased-4
 increasing-3
 institutions-4
 instruction-3
 it-2

to realize-2
 to recognize-2
 valuable-1
 vocational-3
 when the -4
 with-1
 without-3
 workers-3

44 45 in the 46 47

of the 48. The 49 50

51 52 that 53 54 55

in 56. . . .

CONTINUE ON THE NEXT PAGE WITHOUT
 WAITING FOR A SIGNAL.

WORD LIST

Write 5 if the answer is NOT listed.

became-2	moved-3
because-2	moved down-2
came-4	occupational-2
change-1	recognized-1
changed-3	shorthand-4
could-3	since-3
could be-4	soon-3
date-4	stenography-2
first-4	student-1
graduate-4	students-3
graduated-2	study-3
had little-3	subject-1
had no-1	taught-4
here-4	that-3
high-3	the-4
into being-1	their-2
into business-3	there-2
junior high-4	this-1
less-2	time-2
lessened-3	training-4
level-3	usefulness-2
little-1	utility-3
lost-4	vocational-3
manner-2	which-1
method-3	

TRANSCRIPT (Continued)

... When the 57 school 58

59 60, 61 was 62 to

63 64 with 65 66 in

67 68 69 the 70 was

71. It was 72 73 that

74 75 place 76 77 the

78 had 79 80 81 82

by the 83 the 84 85 86...

Write 5 if the answer is NOT listed.

advanced-1	reason-2
age-1	reasons-4
as far as-3	retained-2
at which-4	school-1
at work-1	secretaries-4
be-2	secures-4
date-4	seldom-3
education-2	showed-1
enter-4	so-1
found-4	stenographer-3
graduating-1	studies-2
graduation-3	surveys-1
has-3	takes-1
high school-2	taught-4
in-1	tendency-2
in order-4	that-3
increased-4	there-2
into-2	this-1
job-2	through-4
junior high-4	time-2

TRANSCRIPT (Continued)

... Moreover, 87 of 88

with 89 90 91 92

school 93 94 them 95 as

96. For 97 98, shorthand

was 99 to the 100 101 and

is 102 as 103 104 to the

level-3
 may be-3
 near as-1
 nearly as-3
 offered-3
 often-2
 only-2
 possible-4
 rarely-4

training-4
 undertake-1
 until-1
 upgrade-4
 when-3
 which-1
 will-2
 would-4
 working-2

_____ of _____ the
 105 106 107 108

skill _____ the
 109 110 111 112

student _____ a _____. Because
 113 114

the _____ students _____
 115 116 117

office _____, there is
 118 119 120

_____ a _____ to _____
 121 122 123 124

education _____ the junior college.
 125

Appendix H

IBM 1230 Answer Sheet

LAST FIRST MIDDLE DATE AGE SEX MONTH DATE OF BIRTH
 CITY GRADE OR CLASS INSTRUCTOR

OF TEST PART 1 2

DIRECTIONS: Read each question and its numbered answers. When you have decided which answer is correct, blacken the corresponding space on this sheet with a No. 2 pencil. Make your mark as long as the pair of lines, and completely fill the area between the pair of lines. If you change your mind, erase your first mark COMPLETELY. Make no stray marks; they may count against you.

SAMPLE

CHICAGO is
 1 - a country 4 - a city
 2 - a mountain 5 - a state
 3 - on an island

SCORES

1 _____ 5
 2 _____ 6
 3 _____ 7
 4 _____ 8

IDENTIFICATION NUMBER

0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9

T	F	1	2	3	4	5	T	F	1	2	3	4	5	T	F	1	2	3	4	5	T	F	1	2	3	4	5
1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7
1	2	3	4	5	6	7	11	1	2	3	4	5	6	11	1	2	3	4	5	6	11	1	2	3	4	5	6
1	2	3	4	5	6	7	14	1	2	3	4	5	6	14	1	2	3	4	5	6	14	1	2	3	4	5	6
1	2	3	4	5	6	7	18	1	2	3	4	5	6	18	1	2	3	4	5	6	18	1	2	3	4	5	6
1	2	3	4	5	6	7	22	1	2	3	4	5	6	22	1	2	3	4	5	6	22	1	2	3	4	5	6
1	2	3	4	5	6	7	26	1	2	3	4	5	6	26	1	2	3	4	5	6	26	1	2	3	4	5	6
1	2	3	4	5	6	7	30	1	2	3	4	5	6	30	1	2	3	4	5	6	30	1	2	3	4	5	6
1	2	3	4	5	6	7	34	1	2	3	4	5	6	34	1	2	3	4	5	6	34	1	2	3	4	5	6
1	2	3	4	5	6	7	38	1	2	3	4	5	6	38	1	2	3	4	5	6	38	1	2	3	4	5	6
1	2	3	4	5	6	7	42	1	2	3	4	5	6	42	1	2	3	4	5	6	42	1	2	3	4	5	6
1	2	3	4	5	6	7	46	1	2	3	4	5	6	46	1	2	3	4	5	6	46	1	2	3	4	5	6
1	2	3	4	5	6	7	50	1	2	3	4	5	6	50	1	2	3	4	5	6	50	1	2	3	4	5	6
1	2	3	4	5	6	7	54	1	2	3	4	5	6	54	1	2	3	4	5	6	54	1	2	3	4	5	6
1	2	3	4	5	6	7	58	1	2	3	4	5	6	58	1	2	3	4	5	6	58	1	2	3	4	5	6
1	2	3	4	5	6	7	62	1	2	3	4	5	6	62	1	2	3	4	5	6	62	1	2	3	4	5	6
1	2	3	4	5	6	7	66	1	2	3	4	5	6	66	1	2	3	4	5	6	66	1	2	3	4	5	6
1	2	3	4	5	6	7	70	1	2	3	4	5	6	70	1	2	3	4	5	6	70	1	2	3	4	5	6
1	2	3	4	5	6	7	74	1	2	3	4	5	6	74	1	2	3	4	5	6	74	1	2	3	4	5	6
1	2	3	4	5	6	7	78	1	2	3	4	5	6	78	1	2	3	4	5	6	78	1	2	3	4	5	6
1	2	3	4	5	6	7	82	1	2	3	4	5	6	82	1	2	3	4	5	6	82	1	2	3	4	5	6
1	2	3	4	5	6	7	86	1	2	3	4	5	6	86	1	2	3	4	5	6	86	1	2	3	4	5	6
1	2	3	4	5	6	7	90	1	2	3	4	5	6	90	1	2	3	4	5	6	90	1	2	3	4	5	6
1	2	3	4	5	6	7	94	1	2	3	4	5	6	94	1	2	3	4	5	6	94	1	2	3	4	5	6
1	2	3	4	5	6	7	98	1	2	3	4	5	6	98	1	2	3	4	5	6	98	1	2	3	4	5	6
1	2	3	4	5	6	7	102	1	2	3	4	5	6	102	1	2	3	4	5	6	102	1	2	3	4	5	6
1	2	3	4	5	6	7	106	1	2	3	4	5	6	106	1	2	3	4	5	6	106	1	2	3	4	5	6
1	2	3	4	5	6	7	110	1	2	3	4	5	6	110	1	2	3	4	5	6	110	1	2	3	4	5	6
1	2	3	4	5	6	7	114	1	2	3	4	5	6	114	1	2	3	4	5	6	114	1	2	3	4	5	6
1	2	3	4	5	6	7	118	1	2	3	4	5	6	118	1	2	3	4	5	6	118	1	2	3	4	5	6
1	2	3	4	5	6	7	122	1	2	3	4	5	6	122	1	2	3	4	5	6	122	1	2	3	4	5	6
1	2	3	4	5	6	7	126	1	2	3	4	5	6	126	1	2	3	4	5	6	126	1	2	3	4	5	6
1	2	3	4	5	6	7	130	1	2	3	4	5	6	130	1	2	3	4	5	6	130	1	2	3	4	5	6
1	2	3	4	5	6	7	134	1	2	3	4	5	6	134	1	2	3	4	5	6	134	1	2	3	4	5	6
1	2	3	4	5	6	7	138	1	2	3	4	5	6	138	1	2	3	4	5	6	138	1	2	3	4	5	6
1	2	3	4	5	6	7	142	1	2	3	4	5	6	142	1	2	3	4	5	6	142	1	2	3	4	5	6
1	2	3	4	5	6	7	146	1	2	3	4	5	6	146	1	2	3	4	5	6	146	1	2	3	4	5	6
1	2	3	4	5	6	7	150	1	2	3	4	5	6	150	1	2	3	4	5	6	150	1	2	3	4	5	6

Appendix I

List of Teachers and High Schools Participating
in This Study

TEACHERS AND SCHOOLS PARTICIPATING IN

THIS STUDY

1. Kathy Wright	American Fork High School
2. Erma M. Choate	Ben Lomond High School
3. I. Saville Shupe	Ben Lomond High School
4. Melvin J. Gamble	Bingham High School
5. Brenda Wilde	Bonneville High School
6. Patricia Murphy	Box Elder High School
7. Nanette Savage	Box Elder High School
8. Cleo W. Barker	Bountiful High School
9. Ida R. Leonard	Bountiful High School
10. Gladys M. Mathis	Carbon High School
11. Sharon N. Olsen	Cedar City High School
12. Patricia Ann Pieper	Clearfield High School
13. Glen E. Saunders	Clearfield High School
14. Marvin J. Blanken	Davis High School
15. Ione T. Grange	Davis High School
16. Katherine Blackham	Dixie High School
17. Louise Blacker	Duchesne High School
18. Myrna Ellison	Dugway High School
19. Shirlene Welch	East Carbon High School
20. Jane McClenahan	Emery County High School
21. Pauline G. Lott	Escalante High School
22. Marjorie Donoghue	Grand County High School
23. Joan Lawson	Granger High School
24. Melba R. Black	Granite High School
25. Joyce Sutherland	Granite High School
26. Martha Ann Paver	Highland High School
27. Alice S. Sheya	Highland High School
28. Max Dickson	Hillcrest High School
29. Marjean Gibson	Hillcrest High School
30. Jan Parke	Juab High School
31. Mary D. Nicholls	Kanab High School
32. Mardell Burkert	Kearns High School
33. Laura M. Balls	Logan High School
34. Larry Coleman	Manila High School
35. Mary McCulley	Milford High School
36. Rodney S. Rasmussen	Monticello High School
37. Francis L. Tilby	Morgan High School
38. Jean Duke	Murray High School
39. Bertha Anderson	North Summit High School
40. Richard C. Crocker	Olympus High School
41. Wesley Johansen	Orem High School
42. Shannon Severance	Park City High School
43. June Brown	Payson High School
44. Verlyn Arslanian	Roy High School
45. Linda Sherwood	San Juan High School

- | | |
|--------------------------|--------------------------|
| 46. Barbara M. Carleton | Skyline High School |
| 47. Jessie Cowley | Skyline High School |
| 48. Elizabeth E. Gillard | Skyline High School |
| 49. Edna Brande | South High School |
| 50. Bette Fullmer | South High School |
| 51. Jessie McKinnon | South Rich High School |
| 52. Keith Anderson | Spanish Fork High School |
| 53. Claudia S. Young | Springville High School |
| 54. Leona Murray | Tintic High School |
| 55. Elroy D. Zentner | Tooele High School |
| 56. Robert B. Jameson | Uintah High School |
| 57. Dan G. Berry | Union High School |
| 58. Marilyn Beck | Viewmont High School |
| 59. Joanne M. Cutler | Viewmont High School |
| 60. Sherry Horner | Wasatch High School |
| 61. Myrra W. Newton | Wayne High School |
| 62. Mary B. Durham | Weber High School |
| 63. Lois H. Morrill | Weber High School |
| 64. Barbara L. Brown | West High School |
| 65. Grace Mackay | West High School |
| 66. Janet Nowell | West High School |