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# Incidental Learning During Acquisition of Typewriting Skills

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INCIDENTAL LEARNING DURING ACQUISITION

OF TYPEWRITING SKILLS

(TITLE)

BY

Donna Rae Clendenin

**THESIS**

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS  
FOR THE DEGREE OF

Master of Science in Education

IN THE GRADUATE SCHOOL, EASTERN ILLINOIS UNIVERSITY  
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1970

YEAR

I HEREBY RECOMMEND THIS THESIS BE ACCEPTED AS FULFILLING  
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Donna Rae Clendenin

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## CHAPTER 1

### INTRODUCTION

Students enrolled in all levels of school today have a difficult task before them in that the accumulation of world knowledge keeps doubling every ten years.<sup>1</sup> Students must cope with this vast array of information and must somehow devise ways of digesting both the general and scientific knowledge encompassed in this informational load.

Being concerned with the problems of the youth of today is an important part of a teacher's life. If a way can be found to minimize the task of coping with the mass of information being set before youth every school day, then it must be sought.

Incorporating subjects together might be one solution and it will aid not only the students but also the school, the community, and the nation. Students would have the opportunity to gain knowledge of different areas at the same time and would be shown that distinct areas such as typewriting and economics can be so studied as to benefit one another. The school will gain from the experience by being able to give the students a chance to increase their utilization of inherent intellectual powers while not taxing the class load limit of the teachers. The community and nation would gain from the integration of subject matter because the students who will eventually go into the community and nation to become the leaders will have gained valuable knowledge and information

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<sup>1</sup>Nathan Krevolin, "The Contribution of Typewriting to General Education," Business Education Forum, XXIV (January, 1970), 13.

from the classes; and they will have been shown how different departments of the school can work together. This experience will help the students to better understand that people can work together and accomplish many objectives.

Integrating other areas in the typewriting class can often help the students to do better school work. The typewriter can help students cope with the masses of new knowledge if it is used effectively as an educational tool. Students can use the typewriter for organizing notes and reading materials.

#### Purpose of the Study

As technology can assemble information faster now than ever before, students of today are being asked to learn more material than students of any previous period of time. The problem that the schools are having is how to teach all this new material to the youth of today. If a method of instruction which will aid in the dissemination of valuable information to the students can be incorporated into the schools' programs at little or no cost it should be brought to the administrators' attention and tried in different size schools and at different levels of instruction.

#### Need for the Study

With the curriculum of the elementary and secondary schools already packed with courses and new material constantly being brought in, a new method of instructing students would be an asset to all concerned. The accumulation of world knowledge doubles every ten years. As students must cope with the fantastic amount of material that this accumulation encompasses, helping students find a new way of learning this material would be to everyone's advantage.

Educators need to determine where and how this accumulation of knowledge can properly be incorporated into the school's program. If incidental learning of different educative areas can be accomplished with the building of typewriting skill without hampering the skill building process, it seems possible to use the typewriting class as one means of providing the opportunity of increasing the student's knowledge in different areas.

One of the areas which may be incorporated into the typewriting class is economics. The world is growing at such a fast pace, that people are being asked to not only understand how their individual communities operate and affect the nation's economy, but they are also expected to understand how the economy of this nation affects the economy of other nations. Economic education has become an important part of everyone's life. A person should understand economic concepts in order to manage his personal business wisely and to understand, as an informed citizen, the management of our nation's economy by governmental agencies. Such terms as inflation, labor problems, agricultural needs and foreign policy are constantly in the news. An informed person needs to know and understand these concepts.

It is also important for all students to be economically intelligent as it will help in making wiser judgments in purchasing merchandise and in making reasonable demands on the producers of these goods.<sup>1</sup> Economics helps prepare young people to make decisions that will aid in the competent and effective use of their incomes.

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<sup>1</sup>David Schoenfeld, "The Why and How of Consumer Education," National Association of Secondary School Principals Bulletin, LV (October, 1967), 30.

It is desirable, then, that all students should be enrolled in an economics course during high school. It is especially important that gifted students who might be expected to take roles of leadership be guided into an economics course since principles of business organization and operation and of economics are major factors useful in attaining economic success.

In a study conducted ten years ago, it was found that less than 5 per cent of our high school graduates take a course in economics, and those who do take a course in economics may be assumed to have received inferior instruction since fewer than 25 per cent of high school teachers have even a single course in economics.<sup>1</sup>

The National Association of Secondary School Principals conducted a study in 1964-65 on the teaching of economics in high schools. At that time 20 per cent of the twelfth-grade pupils enrolled in a three-year high school were studying economics in a separate course. In the four-year high schools only 6.1 per cent of the twelfth grade students were enrolled in a separate course for economics.<sup>2</sup>

From these few facts, it seems apparent that there is a need to find a way to help students cope with all the material on the market today and especially to find a way to educate them in the specific field of economics.

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<sup>1</sup>Vernon Quелlette, "Research in Economic Education," National Business Education Quarterly, XXVIII (March, 1960), 9.

<sup>2</sup>Galen Jones, "The Current Status of Economic Teaching in the High Schools of the United States," The Bulletin of the National Association of Secondary School Principals, XLIX (November, 1965), 11.

### Statement of the Problem

The purpose of this paper was to determine if students can learn educational concepts from typewriting material which has interesting and factual information contained within it. The economic phase of education was chosen as the main area of investigation for this study as all students need an understanding of economic concepts to better prepare them to make wise judgments in their own personal and business lives.

### Definitions

ALFT test: A standard achievement test of economic understanding for secondary students. It was developed by E. C. Alft in cooperation with the Illinois Council on Economic Education.

Economics: Study of how production, distribution and consumption of wealth is affected by happenings in the country and world.

Economic Education: Encompasses a study of production, distribution, and consumption of goods, plus a study of comparative economic systems.<sup>1</sup>

Eye-hand span: The interval which expires between the time the eyes read the copy and the time the hands begin to type the copy.

Fixations: The eyes become directed on one word and pause on the word.

Gross Speed: A measure of typewriting speed. The total standard words (five strokes per word) typed during a timed writing divided by the time of the writing in minutes.

Incidental Learnings: Learning which comes through no concerted effort on the part of the student and which comes without the student being motivated to learn or being instructed to do so.

Mean Score: One method of arriving at an average score. The total points of all scores is divided by the number of students taking the test.

Syllabic Intensity: The ratio of the number of syllables to the number of words in a particular timed writing. Syllabic Intensity is commonly used as a measure of typewriting copy difficulty.

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<sup>1</sup>L. Ruth Thomas, "Economic Education Via the Abstraction Ladder," Business Education Forum, XXIV (April, 1970), 28.

Readability Index: The educational level at which a student should be able to read the material given.

Regression: Looking back in the line of type. Regression can be caused by over reading or random oscillation of the eyes.

Timed Writings: A typewriting speed test. Students are given copy to type during a specified time limit.

## CHAPTER II

### REVIEW OF THE LITERATURE

Much research and expository writing has been made available to the educational community on the possibilities of incidental learning which may take place while students are engrossed in various educational assignments. A review of such literature would be necessary for an understanding of the problems involved in incorporating economic education in an instructional program in typewriting technique.

A listing of such available literature was prepared from the card catalog of Booth Library at Eastern Illinois University, from the Business Education Index, the Education Index, and the Readers' Guide to Periodical Literature. The Business Education Curriculum Materials Center of the Department of Business Education and Secretarial Studies at Eastern Illinois University and the personal libraries of fellow graduate students were used to procure materials needed for this investigation. Reference to formal research reports was also made through Dissertation Abstracts and available microfilm.

The literature written on intentional and incidental learnings relates that the rate at which the material is presented plays an important role as to whether or not intentional learning will be emphasized.<sup>1</sup> With a fast rate or a few number of presentations, students still retain some

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<sup>1</sup>Edith Weimark and Irving J. Saltzman, "Intentional and Incidental Learning with Different Rates of Stimulus-Presentation," American Journal of Psychology, LXVI (October, 1954), 21.

of the knowledge contained in the material presented; therefore, incidental learning has taken place.

There exists a difference of opinion regarding the merits of incidental learnings through use of the typewriter. West,<sup>1</sup> and Jarrett and Postman<sup>2</sup> express doubt as to the value of learning without awareness. Others have concluded that incidental learning of other subject matter can take place during the study of typewriting.

After reviewing the literature written on incidental learnings through typewriting, the literature was classified into the following subject areas: reading for typewriting, elementary, English, business and economic education.

#### Reading for Typewriting

The literature on incidental learning through typewriting relates that reading for typewriting differs from ordinary reading. In 1932 Butsch<sup>3</sup> did a study in order to find the way in which the eye follows the copy while a person types and to discover the distance between the eyes' reading position and the hands' typewriting position when typewriting at various speeds. Butsch found that in general the eye-hand span is greater for the more rapid typists and that they carry the eye-hand span over at the end of the line in a larger percentage of the cases. During typewriting, there are more fixations, and they are for a longer

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<sup>1</sup>Leonard J. West, Acquisition of Typewriting Skills (New York: Pitman Publishing Corporation, 1969), p. 316.

<sup>2</sup>Kneen F. Jarrett and Leo Postman, "An Experimental Analysis of Learning Without Awareness," American Journal of Psychology, LXXV (April, 1952), 255.

<sup>3</sup>Russell L. C. Butsch, "Eye Movements and the Eye-Hand Span in Typewriting," The Journal of Educational Psychology, XXIII (February, 1932), 194-21.

duration than for reading for comprehension. No matter what the typewriting speed is the eye is usually one second ahead of the writing. The different types of materials used in typewriting did not make a noticeable difference in the eye movement.

Fuller<sup>1</sup> stated that reading for typewriting is more exact and descriptive than reading for ordinary use. As the mechanics of reading are easier to acquire than are comprehension or word recognition, students with lower standards of intelligence can read for typewriting better than they can read for meaning. Reading for typewriting requires close attention and interest as it goes at a slower pace than does ordinary reading. Fuller found that typewriting reading requires about 3.6 times as many fixations and regressions as does ordinary reading.

The number of fixations had a higher degree of correlation with speed than did regressions alone or fixations and regressions combined. Fuller found that fixations and regressions were largely set by the speed of reading for both ordinary and typewriting reading.

Fuller also found that detailed word recognition patterns are the basic reading patterns for typewriting. If reading by word wholes alone took place, there would be far fewer fixations and regressions; the eye would take in a word at a single fixation and pause while the word was being typed. Instead, there is apparently a more detailed scanning of the words and supplying them to the hand as needed.

As reading for typewriting was shown to differ from ordinary reading, educators wondered if elementary students who were just learning to read would be able to learn to typewrite. Researchers also wanted to

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<sup>1</sup>Donald C. Fuller, "Reading for Typewriting," The Journal of Business Education, XIX (September, 1943), 19-21.

learn if this skill would help or hinder the elementary student's general educational processes.

### Elementary Education

One of the objectives in the field of research in teaching typewriting at the grade school level was to find out if elementary students could learn to typewrite. Rowland<sup>1</sup> in 1930 decided to test the hypothesis that students in the elementary school grades could learn to type. Nineteen fifth and sixth graders were used for the experiment. The students worked for 45 minutes 5 days a week for 15 weeks. Rowland found that students of this age can learn touch typewriting, that there was a relationship between I.Q. and typewriting average scores, and that there was a positive correlation between attendance and achievement in typewriting.

Wood and Freeman<sup>2</sup> soon became interested in the effects that the typewriter had on elementary education. In 1932 they did a study to determine the nature and extent of the educational influences of the portable typewriter when it is used as a part of the regular classroom equipment in the kindergarten and elementary grades.

Their study lasted two years and encompassed fifty-one schools in eight cities. There were 8,823 control students divided into 24 groups and 6,125 experimental students divided into 27 groups which participated in the study. In order to derive the results of this experiment, these students were given the New Stanford achievement test for grades three to six; the Gates Reading test, types one, two and three, for grades one and

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<sup>1</sup>Ralph S. Rowland, "Teaching Typewriting in Elementary Grades," The Journal of Business Education, IV (June, 1930), 15-16.

<sup>2</sup>Frank W. Freeman and Ben D. Wood, An Experimental Study of the Educational Influences of the Typewriter in the Elementary School Classroom (New York: The Macmillan Company, 1932), p. 1.

two; handwriting quality and rate tests; spelling and vocabulary tests.

Evidence for the study was secured from the test results, children's writings, teachers' judgments and testimony of the children themselves. The tests results at the end of the first year showed that the experimental groups had gained most in arithmetic computation, word meaning, geography, and language usage. At the end of the second year they gained mostly in geography, language usage and arithmetic reasoning.

From these results, Wood and Freeman concluded that the typewriter had a positive influence on gains in the type of educational achievement measured by the total Stanford Achievement tests and that the typewriter could be used in most, if not all, subjects of instruction on the elementary school level. The skill gained in the use of the typewriter was clear profit and was not made at the expense of the skill in handwriting. The typewriter also seemed to stimulate the children to a greater increase in output of written material. They further concluded that it is feasible to use the typewriter in the conduct of the ordinary work in the elementary school.

In 1934 Forester<sup>1</sup> did a study on third through sixth graders at the Bradford School in Montclair, New Jersey. The purpose of the study was to find out the differences between typewritten and handwritten compositions on this level of education. Forester used one class on each of the grade levels. Each of the four classes was divided in half. One half of each class was specified as the control group and the other half was specified as the experimental group using typewriters.

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<sup>1</sup>John J. Forester, "Differences Between Typewritten and Handwritten Compositions," Elementary School Principals, XIII (June, 1936), 374-78.

The experimental group worked with the typewriters for twenty minutes a day. During the study they used the typewriters for all their written work. Forester found that the control groups made fewer spelling, punctuation and sentence construction errors than did the experimental group; but that this difference was not to a significant degree.

Forester concluded that the use of the typewriter in the third through sixth grades was justified as the experimental group was able to operate the typewriter accurately. They were also able to compose neater and better quality compositions than the students who did not use the typewriters.

As the studies conducted earlier had used manual typewriters, Rowe<sup>1</sup> decided to use electric typewriters to conduct a study to find out if youngsters at the third and fourth grade levels could learn to typewrite by touch and to see if typewriting could be used to promote the total learning process.

Twenty-four third and fourth graders participated in this study which was conducted during the summer of 1958. The twelve third graders and twelve fourth graders used electric typewriters for eight weeks. As the study only lasted eight weeks and Rowe wanted to teach the students the contents of a year of typewriting, only students from the above average intelligence group were selected.

The control group consisted of twenty-four students who went about their regular summer vacations. The experimental group attended class for forty days, five days a week for eight weeks. This group typed from

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<sup>1</sup>John L. Rowe, "Readin', Typin' and 'Rithmetic," Business Education World, XXXIX (January, 1959), 9-12.

a Gregg typewriting textbook.<sup>1</sup> The material in the textbook had been adapted to the students' reading level before the study began. Each session lasted fifty minutes with a ten minute milk break in between the two twenty-five minute typing sessions.

Before the study began, both groups were given two achievement tests. A motor dexterity test and the California Short form test of mental maturity (Elementary 1957, S-form) were the two tests used. The California test included an achievement test to measure reading comprehension, spelling, capitalization, punctuation and word usage.

After the eight week course and a retesting of the students, Rowe concluded that instruction on the electric typewriter was responsible for significant growth in vocabulary development, in reading comprehension, and in writing accuracy and legibility. The typewriting instruction also encouraged their creative expressions and social learnings.

Since the previous studies had used students from more than one grade level, Erickson decided to conduct a study using only one grade level. The purpose of this study<sup>2</sup> done in 1960 was to determine the effects of the typewriter on selected learning experiences of pupils in the fifth grade. Twenty-four matched pairs of fifth graders participated in the study. The experimental group was given thirty-one and two-thirds hours of formal typewriting instruction before the study began. Erickson stated that based on classroom observation, the use of the typewriter seemed to have a positive effect in helping the pupils develop neatness and accuracy, proofreading skills, ability to follow and interpret directions and ability

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<sup>1</sup>Alan C. Lloyd, John L. Rowe, and Fred E. Winger, General Typing I (2nd ed.; Chicago: Gregg Publishing Division, McGraw-Mill Book Company, Incorporated, 1953).

<sup>2</sup>Lawrence W. Erickson, "The Typewriter--A Tool of Learning in the Elementary Grades," Balance Sheet, XLII (October, 1960), 52-55.

to work independently. During the experiment, the use of the typewriter did not have any statistically significant effects upon the changes in general academic achievement. But the experimental group did achieve in spelling, capitalization and language usage.

Erickson concluded that typewriting instruction improved working habits in the following areas: mechanics of English, composition skills, and speed and quantity of handwriting. Students who used the typewriter needed less time to write reports for other subjects. These reports were longer in length, better organized and easier to read than those of the control group.

After interviewing leaders in the field of elementary typewriting and reviewing the literature on the subject, Krevolin<sup>1</sup> concluded in 1965 that grade five was the best grade to teach elementary typewriting. The best typewriting class for elementary students would be a twenty minute class which would meet once a day for one semester. The class could be taught by the regular classroom teacher as a whole group in the regular classroom or in small groups in a typewriting corner of the regular room. An elementary typewriting textbook which emphasized personal use theory rather than vocational preparation would be the best textbook to use. When it is not feasible to integrate typewriting into the regular classroom program, a summer program could be instituted into the school's program.

After making these conclusions from the interviews, Krevolin did a study to find ways of implementing the typewriting program in the elementary grades and to measure the ancillary language-arts benefits of the

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<sup>1</sup>Nathen Krevolin, "How Can We Best Implement Elementary School Typing Classes?" Business Education World, XLV (November, 1965), 11-15.

typewriting program tested. He used two groups of twenty-six students. One group acted as the control group and the other as the experimental group. The experimental group typed from materials designed especially for elementary students. These materials and techniques designed for elementary grades greatly facilitated the teaching of typewriting to the intermediate level pupils.

Krevolin found that elementary students can learn to typewrite on this level; that typewriting accelerates ancillary language arts growth as the experimental group's test scores had a .4 gain in word meaning over the control group's scores; a .5 gain in paragraph meaning; a .7 gain in spelling and a .2 gain in language. The typewriter was found also to stimulate creativity and to facilitate production of work.

In 1968 Granstaff<sup>1</sup> confirmed Krevolin's conclusions about language-arts gains when she did a study with fifth graders to find out if typewriting can serve as a tool for promoting growth in the language-arts learning process in the elementary students.

Stuart<sup>2</sup> wanted to study the influences that the portable manual typewriter would have on elementary reading when the typewriter was used as a part of the regular classroom equipment in the first grade. She used 113 experimental and 113 control students. The experimental group worked at the typewriter for seventy-five to ninety minutes per week during the study which lasted seven months.

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<sup>1</sup>Sarah Granstaff, "An Experimental Study to Determine the Influences of Typewriting Instruction on Language-Arts Achievement in the Elementary Grades," National Business Education Quarterly, XXXVIII (Fall, 1969), 13.

<sup>2</sup>Cecilia Unzicker Stuart, "Effect of the Use of the Typewriter on Beginning Reading," The Journal of Business Education, XII (March, 1937), 20.

The results of all the tests and the subjective evidence of the study indicated a trend of slight but constant superiority on the part of the pupils who used the typewriters. The experimental group showed more pronounced gains in reading ability than did the control group. It was found that the reading of children with lower intellectual ability was aided most by the use of the typewriter.

In 1942 Templeton<sup>1</sup> wanted to find out if by using proper typewriting methods students would still improve their reading and spelling abilities. Templeton used only one group of students and taught them correct typewriting techniques. They typed for forty minutes for forty days. Before and after the experiment the group was tested for their reading and spelling abilities. After the study was concluded, Templeton found that all the students improved in both their spelling and reading abilities. Some of the students improved in their spelling ability by two to four years and their reading level by one year. This experiment used borderline reading students for the experimental group.

Tate<sup>2</sup> also did a study with remedial reading. He wanted to determine the usefulness of the typewriter in remedial instruction in reading and language in the intermediate grades.

Tate selected fourth, fifth and sixth grade students with below average reading ability for this study. Ten pupils from each grade were selected for the experimental group. A matched group was selected to be the control group. The experimental group was not taught proper typewriting techniques. Their typewriting instruction was very informal.

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<sup>1</sup>Winifred Templeton, "The Effect of Instructed Typing Practice on Pupil's Ability to Read and Spell," The Balance Sheet, XXIII (January, 1942), 218-19.

<sup>2</sup>M. W. Tate, "Use of the Typewriter in Remedial Reading and Language," The Elementary School Journal, XLIII (April, 1943), 481-85.

Although Tate stated that the results of this test were not statistically reliable, it was evident that the typewriter is of some value to remedial reading students. The students did gain more in spelling and language usage than did their control counterparts. The experimental group also showed more interest in their work and liked school better when the study was being conducted.

As students were found to improve in language arts, reading, spelling and other areas by using the typewriters, educators on the secondary level became interested in learning if the typewriter could be used to implement educational programs on the high school level.

#### English

Fitch<sup>1</sup> used 621 junior students from 7 public schools in Southern California to find out if students could gain grammar knowledge in advanced typewriting. The students were divided into one experimental group with 213 students and 2 control groups. The experimental group consisted of second semester typewriting students who typed from specially prepared supplementary material for a portion of each typewriting class--ten minutes for sixty days. These students were given an intelligence test and a reading comprehension test the results of which were compared with the control groups.

Fitch used two control groups. One was composed of juniors who were not taking typewriting. It was from these students that an index of normal gains in knowledge of formal grammar was determined. The second control group was enrolled in the typewriting class and used the typewriting textbook during the study.

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<sup>1</sup>Stanley K. Fitch, "Learning Grammar in Advanced Typewriting," Journal of Business Education, XXXVIII (November, 1962), 61-62.

A grammar test was given before and after the experiment. The experimental group typed from specially prepared material. The text of this material was based on the contents of the grammar test. The students subjected to the supplemental typewriting material did not show a significant gain in formal grammar knowledge, but did gain significantly in typewriting skill.

From the study it was concluded that students cannot incidentally learn formal grammar through typewriting classes and that practice on meaningful material results in greater typewriting skill than practice of nonsense syllables, therefore, it was concluded that typewriting students should practice on connected materials as much as possible.

The Baty<sup>1</sup> study was conducted in 1958 to determine if students who typed from materials in which the meanings of unusual words are obvious from context will experience a significant increase in vocabulary and a normal increase in typewriting skill.

Baty used two experimental groups. One (A) which typed for ten minutes a day on paragraphs containing unusual words whose meanings were apparent from the context. The second group (B) typed for ten minutes each day from paragraphs containing the same unusual words employed in such a way as not to reveal the meaning. The control group was not supplied with specially written supplemental materials.

Of the thirty unusual words-in-context paragraphs, ten were presented to the experimental groups for practice on one occasion only; ten were presented three times each; and ten were presented six times each.

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<sup>1</sup>Wayne Baty, "Incidental Learning of Vocabulary in Beginning Typewriting Classes," National Business Education Quarterly, XXVIII (October, 1959), 7-8.

At the end of the study it was found that the experimental group A gained 8.37 words; experimental group B gained 1.12 words and the control group gained .76 words. These differences were significant on the .0005 level. Experimental group A gained more on the words which were presented six times. As far as typewriting skill was concerned, Baty found that group A gained 13.02 words, group B, 12.43 and the control group 8.98. Thus, concluding that the gain in vocabulary was a function of the number of repetitions of each timed writing and that the typewriting skill of the experimental groups was not impaired from typewriting material with meaningful content.

Balcziak<sup>1</sup> did a study on the effect of typewriting instruction on the ability to spell. The purpose was to determine if typewriting instruction at the secondary school level might yield some incidental learnings of spelling. Five large sized secondary schools of Southern Minnesota were used. In each school there was an experimental group and a control group of tenth grade students. The experimental students were in the typewriting classes and the control group was in the English classes. All groups were given a fifty item spelling test at the beginning of the school year, fall 1958, and the same spelling test was again administered during the last week of May, 1959.

Although the experimental groups did not show a significant gain over the control groups, all groups did improve in spelling when tested in May.

A study to determine if students in the typewriting classes could learn the content of short stories as they typed the stories was conducted

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<sup>1</sup>Louella Balcziak, "The Effects of Typewriting Instruction on the Ability to Spell," National Business Education Quarterly, XXX (October, 1961), 8.

by Palmer.<sup>1</sup> Two other purposes of this study were to find out the relationship between the learning achieved by students in typewriting and the learning achieved by students in English and also to find out if attempting to learn the content of short stories will improve or impede typewriting skill.

Palmer's procedure was to use 4 schools, 16 teachers and 973 students divided into 3 groups. A typewriting experimental group, an English control group and a typewriting control group were all used in this study. The experimental group was instructed to learn content while the stories were being typed as timed writings; the English control group was told to learn the stories while reading them; and the typewriting control group held a regular class.

Each group was given a pre-test on the stories. Each used fifteen minutes a day, three days a week for three weeks to learn the stories. At the end of the three weeks, a post-test was given; three weeks later a post-post-test was given. The typewriting scores at this time were recorded.

Findings from this study indicated that at the time of the post-test both experimental and control groups had gained: the experimental group gained seven correct answers and the control group nine. At the time of the post-post-test, the experimental group retained six correct answers which represented a significant difference beyond the .05 level in favor of the experimental group. In typewriting the experimental group had increased seven and one-half words per minute and the typewriting control group four and one-half.

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<sup>1</sup>Kermit Glenn Palmer, "Constructed Content Learning in the Typing Class," (unpublished Doctor's dissertation, University of Southern California, 1967).

Palmer concluded that students can learn the content of materials they type, and students who learn from typewriting have a better retention than those who learn from reading. Students who concentrate on learning the content also gain more skill in typewriting than do the students who disregard the content of practice material.

Palmer recommended that experiments be conducted to determine the relationship between typewriting skill and the ability to learn meaningful material, and that experiments be conducted in order to determine the ability to learn while typewriting material other than timed writings. He also suggests that students should use typewriting to organize and study class notes, and that teachers in different disciplines should provide some materials to be typed in the typewriting classes.

#### Business

Palmer<sup>1</sup> was interested not only in English but in business law also and did a study on the learning of business law terms in typewriting. Students in three beginning typewriting classes were used for this study.

The students were pre- and post-tested. On the pre-test, the mean score was 10.1687, and they had a gross speed of 18.84. For five weeks the students were given a total of twelve paragraphs to type. The paragraphs were from 111 to 495 words in length. Only one paragraph was given a day, and it answered two of the questions on the pre-test. The paragraphs were given on a different day each week of the study. Students worked for control on the paragraphs and were given ten minutes practice on them. On each timing, they figured their gross speed.

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<sup>1</sup>Kermit Glenn Palmer, "Learning Business Law Terms in Typing," Journal of Business Education, XXXVIII (April, 1963), 289.

At the end of five weeks the gross speed was 27.81; thus, indicating that speed was not impaired. The economic post-test had a mean score of 13.8676. When the matched scores were compared, 6.61 was the standard error of difference between the two uncorrelated means. Palmer used statistics to conclude that the difference between the sampling means is a difference that could not have occurred by chance.

As economics has become an important part of a student's education, educators interested in this field began to investigate the possibility of integrating economics with typewriting instruction.

### Economics

Schoenfeld stated that if people are unable to live well in their particular society, then the education given to them was deficient and inadequate. In order to live well, people need to be able to effectively utilize their incomes. One way to provide for this effective utilization of income is to educate people in consumer economics.<sup>1</sup>

This statement is indicative of why the Illinois state legislature recently passed a law making it a requirement for high school graduation that each student be taught consumer education.

Lawmakers as well as educators realize that educating young people in consumer economics not only helps them but also assists the entire nation in three important ways: (1) as users and consumers of America's goods and services, economic understanding helps to make better economic decisions; and, therefore, aids the entire American economic system to function properly; (2) as citizens and contestants in the world struggle,

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<sup>1</sup>David Schoenfeld, "The Why and How of Consumer Education," National Association of Secondary School Principals Bulletin, LV (October, 1967), 27.

it helps in the choice of leaders whose economic politics will ensure world leadership; and (3) as individuals, it helps to obtain the highest possible standard of living for future generations. As the individual becomes informed on economic matters, he understands them better and makes wiser judgements and demands on the producers.<sup>1</sup>

Hodge<sup>2</sup> stated that the National Task Force on Economic Education lists the following items as being necessary for minimum economic understanding:

1. How a basically private economy fixes its priorities and uses its resources. How supply, demand and prices operate. Why competition is essential in the market. How the government influences competition and the use of resources. People should recognize such concepts as labor, productivity; the law of diminishing returns; savings, investment and capita formation; and the profit incentive.
2. Second, people should be aware that fostering stable economic growth and avoiding peaks and troughs of booms and depressions is one of our greatest problems. People should know how we measure economic growth in terms of national production and income and what constitutes a reasonable rate of growth.
3. Finally, who gets the goods and services the economy turns out and in what share? Americans should know that high wages rest on the high productivity of labor and that inequalities continue to exist in the distribution of incomes. We should know that profits come as payment for providing capital goods, taking risks and managing business operations; that without the profit incentive, we could not have had the economic growth that our society has enjoyed.

In order for students to understand these economic theories, they need to come to think of economics as a real problem and a real need. Economics should imbue some of the excitement of life. Students should be given all the outlooks--business, labor, agriculture, government and union. Students should come to understand the American economy and how it operates, both in theory and in practice. They should learn to evaluate

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<sup>1</sup>William R. Tucker, "An Experimental Study to Determine if Basic Economic Concepts Can Be Taught Incidentally in Typewriting Class" (unpublished Master's Thesis, San Diego State College, 1963), 12.

<sup>2</sup>Hodge, op. cit.

its performance, to compare it with other economic systems, and to study its problems and possibilities.<sup>1</sup> Our future leaders need to understand and know these things in order to foster our nation.

The problem is finding a way to teach students so many things. One way to teach all these is to set up a specific course for the sole purpose of educating the students in economics. But there are some systems where this is not feasible at this time; so other alternatives need to be found. One of the alternatives could possibly be to incorporate the teaching of economics with the teaching of typewriting.

Baty<sup>2</sup> stated that if the material that students are typewriting is significant and interesting, students will know what it is about. When one types a drill, he practices on difficult words, he reads with his eyes and he reads the words again when the paper is checked. If the material is interesting, the higher order in the mind will focus on it; and therefore, the idea is more likely than not to be comprehended by the brain.

Before a new method of instruction would be begun, its merits would need to be investigated. One way to investigate the merits of integrating the teaching of economics with that of typewriting would be to review the literature written in this area.

Orpin's<sup>3</sup> study was conducted in order to measure the extent to which economic concepts could be learned from exposure to and from practice of typewritten copy containing economic content.

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<sup>1</sup>National Education Association, "Need for High School Economics," Balance Sheet, XL (January, 1962), 223.

<sup>2</sup>Wayne Baty, "What We Type Is Important Too!," Journal of Business Education, XXXIII (March, 1958), 245.

<sup>3</sup>Carol E. Orpin, "An Experimental Study for Improving Economic Literacy Through Typewriting," (unpublished Master's Thesis, San Francisco State College, 1960).

Three control groups and three experimental groups were used in this study. The six groups had a total of 199 students--90 in the control groups and 109 in the experimental groups.

These 199 students were given a pre- and post-economics test. On the pre-test the mean scores for the control and experimental groups were 23.28 and 23.36 respectively. On the post-test, they were 22.96 for the control section and 27.16 for the experimental.

The conclusions of this study were that students can improve in economic literacy through typewriting material with economic content and that intelligence is an important factor in determining the level of economic literacy possessed by high school students.

The Tucker study<sup>1</sup> completed in 1963 had as its purpose to determine if students could learn economic concepts while typewriting and to determine if typewriting skill would be hindered by typewriting material with economic content.

Tucker used one experimental class and one control group. The experimental group used typewriting drill warm-ups which contained phrases allied to the basic economic problem given to the class for the week.

These phrases were typed five times in the first ten minutes of class time. If the students did not complete them, they were asked to complete them either after school or at home. On Tuesday and Thursday the experimental group was given special lessons which were similar in nature to problems in the regular typewriting text but which contained economic subject areas in their content.

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<sup>1</sup>William R. Tucker, "An Experimental Study to Determine if Basic Economic Concepts can be Taught Incidentally in Typewriting Class" (unpublished Master's Thesis, San Diego State College, 1963).

The students in both groups were given a pre- and post-test in both economic thought and typewriting skill. Tucker also gave a recall test four to nine weeks after the phrases were presented.

After the study was run, Tucker concluded that students can learn economic concepts incidentally while typewriting and that students do retain this knowledge as judged by the recall tests. From the typewriting skill tests, it was concluded that students' skill was not affected by typewriting informative material.

In 1962 Clayton<sup>1</sup> tested the hypothesis that typewriting students could increase their economic understanding while using timed writings in which certain economic concepts were obvious. The other purpose was to find out if those who typed the specially prepared material would make any greater gains in typewriting skill than those who were in the control group.

Five high schools and 224 students were chosen to participate in this study. Each school had one experimental and one control group. The experimental group typed five minutes on special writings and had two minutes to proofread. While the experimental group typed these special writings, the control group would type from the regular typewriting textbook. The special writings were given for forty-five days during the second semester typewriting class. Other than differences in material, all other class work was alike. The writings were on concepts that the ALPT test of economic understanding dealt with. They were from 500 to 600 strokes in length and the syllabic intensity was between 1.3 and 1.4; their readability index was of grades seven through ten.

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<sup>1</sup>Dean Clayton, "Incidental Learning of Economic Concepts in Beginning Typewriting Classes" (unpublished Doctor's dissertation, Oklahoma State University, 1963).

From this study, Clayton concluded that students can increase their economic understanding by typewriting specially prepared timed writings presenting economic concepts and that these students will also show comparable gains in typewriting skill when compared to those who type from the textbook.

Hanson's study<sup>1</sup> in 1964 investigated the possible gains in economic understanding resulting from typewriting from copy with economic content. This study used sixty-nine second semester typewriting students. There were thirty-eight in the experimental group and thirty-one in the control group. The Standard Achievement Test of Economic Understanding for Secondary Schools (Alft) was administered to the experimental and control groups at the beginning of the study and at the end of a six weeks study period. The experimental group typed from specially prepared timed writing materials which dealt with economic concepts included on the Alft test while the control students typed from the regular textbook.

Hanson found that students increased in economic understanding as a result of typewriting materials containing economic content. She also found that tenth grade students were able to comprehend economic information. The students who typed the materials containing economic content showed a comparable growth in typewriting skill to those who used regular copy material.

The purposes of the Humphrey study<sup>2</sup> were to determine if high school students could learn economic concepts concomitantly as they typed from

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<sup>1</sup>Marilyn J. Hanson, "Gains in Economic Understanding and Typewriting Speed as a Result of Using Typewriting Copy Containing Economic Content," National Business Education Quarterly, XXXIII (October, 1964), 26-27.

<sup>2</sup>Thomas Robson Humphrey, "An Experimental Study to Determine if Beginning Typewriting Students Can Learn Basic Economic Concepts Incidentally While Learning the Skill of Typewriting," (unpublished Master's thesis, San Diego State College, 1965).

specially prepared material containing these concepts and to determine if either speed or accuracy were hindered during the experimental period.

One experimental group and two control groups were used in this study. Students were given a speed test at the beginning and at the end of the study. They were also given the Survey of Economic Competency test at the beginning of the study. During the eight week experimental period, two special timed writings were given and proofread twice a day for two days each week. The Economic Competency test was readministered in part with two tests being given over the materials covered.

Humphrey found that gains in economic understanding would result from concomitant learning in the typewriting class apart from intentional learning in other classes. The experimental group was also found to make slightly higher gains in typewriting skill than did the typewriting control group.

A later study in this area was done by Clark.<sup>1</sup> The main objective of this study was to determine whether it is possible to teach economic information concurrently and incidentally with the normal teaching of typewriting skills.

Clark used 467 ninth graders in 16 classes attending 9 junior high schools in Minneapolis, Minnesota. He decided to use two experimental groups. One typed timed writings from specially prepared copy containing economic information, and the second group typed from timed writings specially prepared from their typewriting textbook. Each group took three minute writings two or three times a day for nine weeks until eighty-six writings were completed. Typewriting speed and accuracy

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<sup>1</sup>Marvin Altyn Clark, "Incidental Learning of Economics in Beginning Typewriting" (unpublished Doctor's dissertation, University of Minnesota, 1967).

scores were obtained from two three minute writings at the beginning and at the end of the study. Economic achievement tests were given as pre- and post-tests.

Clark found that both groups made equal gains in typewriting speed; therefore, typewriting copy used had no effect on typewriting speed gains. The second group did not differ significantly at the .05 level of accuracy; therefore, content had no effect on accuracy gains. The experimental group using economic information scored significantly higher than the group using textbook copy material on the economic post-test and made a significantly higher gain from the pre-test to the post-test. Therefore, economic content apparently had an effect on the student's economic achievement.

Clark concluded that students using economic copy material will show an increase in variability of economic achievement and that typewriting copy containing economic information contributed to an increase in economic achievement without affecting typewriting speed and accuracy.

As of 1970 high schools in the state of Illinois are obligated to teach consumer education, but the legislation only specifies that it must be taught and not how; therefore, the following study was conducted in the Chicago, Illinois area by Bober.<sup>1</sup> The purpose of this study was to determine whether economic concepts could be conveyed as concomitant learning while students typed specially prepared economic materials during their timed writings.

The study consisted of two groups of students. There were 184 students in the control group and 156 in the experimental group. Both groups were pre- and post-tested on economic concepts. The test given

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<sup>1</sup>Gerald F. Bober, "Teaching Economics--Incidentally," The Journal of Business Education, XIV (December, 1969), 111-12.

was constructed by the Bureau of Business Education. The control groups average score on the pre-test was 16.28 and the experimental groups' was 16.73. After the study, during which the experimental group typed from the booklet "Timed Writings to Teach Economic Concepts at the Typewriter", the students were again tested. This time the control group had an average score of 17.1 and the experimental group had an average of 21.4. This increase in score was significant at the .05 level and was assumed to have been the result of the students typewriting from the specially prepared booklet. It was concluded that students can learn economic concepts concomitantly as they type specially prepared timed writings.

## CHAPTER III

### FINDINGS

It was the purpose of this study to survey the literature pertaining to incidental learning through the use of the typewriter with major emphasis being placed on learning economic facts concomitant with typewriting skill. A library research technique was the major means of obtaining the information needed to fulfill the purpose of the study.

#### Reading for Typewriting

A person reads differently for typewriting than for ordinary reading. Reading for typewriting has more fixations, requires close attention and interest to the material being typed, and goes at a much slower pace than ordinary reading. In reading for typewriting the eye is usually about one second ahead of the hand. The basic reading pattern for typewriting is one of detailed word recognition.

#### Elementary Education

Young students even in the lower elementary grades have been found to be able to typewrite.

The typewriter can help young students to deal more effectively with their individual reading problems. Typewriting helped first graders to read more fluently, express themselves better and write with greater smoothness than those who wrote by longhand.

In the intermediate grades, the typewriter stimulated students to do better work in school and also motivated them to come to school.

Their interest in their work was aroused when they were participating in a study.

Students were found to produce more written work and the work was usually longer than those who did the assignments in longhand. Their understanding of words and sentences was increased, they were able to follow directions better and were better able to locate the central idea of the work and to organize their own writings.

Spelling was another area that was affected by using the typewriter. Students did better when they typed rather than wrote their spelling words.

#### English

It was found that high school students were not able to learn formal grammar incidentally through typewriting material containing the grammatical concepts. Vocabulary, spelling and short story comprehension were all found to be increased by using the typewriter as a means of learning. These studies also indicated that typewriting skill was not adversely affected by typewriting material which had meaning.

#### Business

Students who typed from paragraphs which contained business law terms were found to increase their understanding of these terms.

#### Economics

Economics is an area which everyone should be acquainted with especially those students who are to become the leaders of the future. They need to understand the basic facts that keep the world moving and how the economy of their own and other countries works both in theory and in practice.

Findings in this area indicate that a student will know what he is typewriting if the material has interesting and meaningful content. Interesting content will be focused on by the mind and, more likely than not, be comprehended by the brain.

Students who typed from copy containing economic content, from warm-up drills containing economic problems, from timed writings in which certain economic concepts were obvious, or from specially prepared booklets with economic concepts were found to gain economic understandings from the typewriting class.

In addition to being able to learn economic concepts concomitantly with typewriting, students typewriting speed and accuracy were not adversely affected by typewriting from meaningful materials. Students who were called upon to take recall tests weeks after their individual study were found to be able to recall the information more successfully than their control counterparts.

## CHAPTER IV

### CONCLUSIONS AND RECOMMENDATIONS

#### Conclusions

Elementary age students can learn to typewrite even though their coordination is not fully developed. These students can benefit from the typewriter as it has been proven in different studies to aid the students in their reading ability, in language-arts comprehension, in spelling, in punctuation and in creative writing. These younger students are stimulated by the use of the typewriter and become more interested in their lessons and in school in general.

High school students can learn vocabulary words, spelling words, the content of short stories, and business law terms just by typewriting from materials which contain the specific information from the different areas.

The largest area covered in this study was the area of economics. The general conclusion of all studies and of this paper is that the typewriter can aid students in learning valuable economic concepts which they will need in their future life.

Even though students were able to learn facts from using writings which contained the information, the students' typewriting skill in speed and accuracy was not affected. Students who typed from the meaningful materials showed as comparable a gain in speed and accuracy as did the students who typed from the regular typewriting textbook. Some of the

experimental students even did better in speed and accuracy improvement after they had used the informative materials.

### Recommendations

The following are the recommendations which have been based on the findings and conclusions of this study:

1. Since the typewriter has been shown to be helpful in the elementary grades, it should be tested more in the elementary programs in order to determine its effects on elementary students' general learning processes.

2. As elementary students can benefit from the typewriter, especially in reading, the teachers should utilize the typewriter in the reading programs.

3. The typewriter should also be used to help increase the language-arts knowledge of students. The typewriter could be incorporated into the regular classroom routine and students could type from materials which contain language-arts information.

4. On the high school level it seems to be possible to use typewriting copy materials containing economic information as a means of transmitting economic concepts; therefore, typewriting and economics teachers should utilize this technique.

5. Teachers in other areas should help in making materials for the typewriting class which will benefit their particular field.

6. The typewriter should be used as a means of transmitting knowledge other than economics on the secondary level.

7. Further study in the incidental learning area should be conducted.

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