

Effect of Typing on School Achievement in Elementary Grades

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FOR 40 years there has been a persistent interest in the question of what effect typing might have on the school achievement of lower grade school children. Over 900 studies have been made during this period of time that deal in total or in part with the typewriter in classroom instruction. These studies deal with almost every conceivable topic related to typewriting. It is interesting to note that the University of Southern California and the State University of Iowa accounted for more studies of this type than any other of the universities: 63 and 54 respectively (Rahe, 1964).

As early as 1926, shortly after the portable typewriter was put on the market, a special Underwood machine was built, by request of John T. Underwood. This machine had Library Gothic type to approximate closely the plain letters of manuscript writing. It was used in the first grades of the Horace Mann School at Columbia University. The teachers were convinced that the typewriter would be of value in the classroom.

Conrad (1935) conducted a study at the Horace Mann School in 1930-31 to determine growth in the speed and quality of typed and manuscript writing, and to evaluate the typewriter as a practical educational tool for young pupils. One hundred fifty pupils from two second grades, two third grades, and four

fourth grade classes were selected. The children were paired as closely as possible on the basis of chronological age and mental age. One group in each grade used the typewriter for written work. The other group had no typewriters but wrote in manuscript form. In November at the beginning of the study and in May at the end of the study, the subjects were given tests in the Stanford Achievement Battery. Results in reading, language composition, computation, and spelling showed large gains by the experimental typing groups over the control manuscript writing groups.

In 1932 a number of educators were approached and asked if they would sponsor a study to find out whether the portable typewriter was a practical tool in the classroom. This study was undertaken by the Typewriter Educational Research Bureau under the direction of Ben D. Wood of Columbia University and Frank N. Freeman of the University of Chicago. It was sponsored by a number of typewriter manufacturers in the United States.

The two-year study, "An Experimental

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Study of the Educational Influences of the Typewriter in the Elementary Classroom," was carried out under different conditions in both public and private schools in all parts of the country. The results indicated that children who used the typewriter advanced more rapidly in all subject matter in the elementary school than those children who did not use the typewriter.

From grades three to six the partial correlational studies indicated that the total Stanford Achievement Test gains were positive although small. "Taking the test results of both years together with the other available evidence, it seems reasonable to conclude that the typewriter can be used advantageously in most, if not all, of the subjects under instruction in the elementary school. There is fairly consistent evidence that the typewriter's influence on spelling is more favorable than on any other subject tested in the Stanford Achievement Test" (Wood and Freeman, 1932).

In 1942 Tate studied the effects of using the typewriter in the classroom instruction of retarded intermediate grade school pupils. The purpose of his study was to determine the usefulness of the typewriter in remedial instruction in reading and language in the intermediate grades. Matched pairs of subjects from the fourth, fifth, and sixth grades were divided into control and experimental groups of 30 pupils each. The experimental group was given 30-minute daily instruction in typing while the control group engaged in activities without typing for periods of the same length. The Stanford Achievement Test was used as pre- and post-test in measuring scholastic gains in paragraph meaning, word meaning, spelling, and language usage.

Perhaps the most noticeable result was that both groups made more than the average gains expected of the lower half of intermediate grade classes. Superior gains were made by the experimental group in spelling and language usage. "It is rather evident that the typewriter is of some value in the remedial teaching of spelling and language usage" (Tate, 1943).

Rowe (1959) found that the typewriter had a very striking effect upon reading and vo-

cabulary. For an eight-week summer period during 1958 he taught typewriting to 24 third and fourth grade pupils. Reading comprehension and vocabulary development of pupils given typewriting instruction were compared with those of a group of pupils who did not have typewriting instruction but pursued normal vacation time activities. Rowe found that the experimental group increased four months in reading comprehension and seven months in vocabulary development, as compared with the control group's loss of one month in reading comprehension and three months in vocabulary development.

Glow (1961) at Teachers College, Columbia University, studied what effect the use of the typewriter in the elementary school classroom had on selected learning experiences of pupils of the fifth grade level. Twenty-four matched pairs of pupils constituted the control and experimental groups. The use of the manual portable typewriter with the experimental group constituted the experimental variable. The study done in a New Rochelle school extended over six months.

The most significant finding of this study was that the use of the typewriter appeared to have a detrimental effect on the reading comprehension of the experimental group when compared to the control group's reading comprehension. It was pointed out that this effect had compensations. There were increases in interest in school work and in the amount of written work produced by the experimental group. The use of the typewriter seemed to enable the pupil to produce work at a faster rate while maintaining a high level of interest.

Problem and Purposes

The purpose of this study was to determine the effect that the typewriter in the elementary classroom had on the educational behavior of children, as indicated by their scores on standardized achievement tests. Since 1932 elements of this important question have been examined periodically. The present study was an attempt to discover what

differences the use of typewriters in the classroom might have on the gain scores of 18 subjects. Third and fourth grade students who were given instruction and used electric typewriters in the classroom were compared with students who were given no instruction or use of the typewriters. The subjects were eighteen matched pairs divided into an experimental group and a control group. The subjects were matched on the basis of motor dexterity as determined by the Lincoln-Oseretsky Motor Development Scale.

Source of Variance	Sum of Squares	df	Mean Square	F
Blocks	358.33	3	119.44	2.67
Groups	2.05	1	2.05	.05
Occurrences	4.50	1	4.50	.10
B X G	217.52	3	72.51	1.62
B X O	27.60	3	9.20	.21
G X O	.22	1	.22	.005
B X G X O	245.35	3	81.78	1.83
Error	8501.92	56	44.68	—
TOTAL	9357.5	71		

Table 1. Analysis of Variance of Word Meaning Scores on Stanford Achievement Test

The 36 subjects attended the six-week summer session of half days at the campus school at Northern Illinois University during the summer of 1969. The subjects were given pretests prior to the session and post-tests on the last day. The battery used was the Stanford Achievement Test (1964), Intermediate Battery in word meaning, paragraph meaning, spelling, word study skills, and language usage. Form W was used as a pretest and Form X was used as a post-test.

Matching was done on the basis of individual scores made by the subjects on the Lincoln-Oseretsky Motor Development Scale. This test requires a number of demonstrations of skill on large and small muscle dexterity tests. Each skill was graded according

Source of Variance	Sum of Squares	df	Mean Square	F
Blocks	551.70	3	183.90	1.76
Groups	53.39	1	53.39	.51
Occurrences	.50	1	.50	.005
B X G	962.56	3	320.85	3.07 *
B X O	.96	3	.32	.003
G X O	9.39	1	9.39	.089
B X G X O	972.17	3	324.06	3.10 *
Error	5852.83	56	104.51	—
TOTAL	8403.5	71		

* $p < .05$

Table 2. Analysis of Variance of Paragraph Meaning Scores on Stanford Achievement Test

Source of Variance	Sum of Squares	df	Mean Square	F
Blocks	212.64	3	70.88	.50
Groups	78.13	1	78.13	.55
Occurrences	5.01	1	5.01	.035
B X G	220.44	3	73.48	.51
B X O	4.38	3	1.46	.01
G X O	7.34	1	7.35	.05
B X G X O	232.17	3	77.38	.55
Error	7930.87	56	141.62	—
TOTAL	8690.98	71		

Table 3. Analysis of Variance of Spelling Scores on Stanford Achievement Test

to specific instructions and the scores were summed into a total psychomotor development score.

For a half hour on three days each week the experimental group was given instruction in typing by a classroom teacher who used the Gregg "You Learn To Type" material for lower grade children. The material included recordings and student drill books. All the typewriters used were electric machines manufactured by Olivetti-Underwood Company. While this group was experiencing typing instruction, the control group was given experiences of a psychomotor nature in the gymnasium. Other than this, the program for both groups and the teachers for both groups were the same. The experimental group used the typewriters wherever possible in producing written work. The summer program was an enrichment rather than a remedial one.

Hypothesis

It was hypothesized that the classroom use of typewriters by third and fourth grade students would influence their scores on tests in word meaning, paragraph meaning, spelling, word study skills, and language usage. The experimental group experiencing six weeks of typing instruction would improve significantly more in these areas than the control group experiencing no typewriter use.

Methodology

The 36 subjects were listed in rank order on the basis of scores on the Lincoln-Oseretsky Motor Development Scale. The odd numbered subjects on this list were transferred to a second listing. By a coin toss

one list was determined to be the experimental group and the remaining list was designated the control group.

The subjects were assigned to four levels in the experimental and the control groups. The top three levels contained five subjects each. The lowest levels contained three subjects each. Comparisons were made between levels in order to reduce the error variance. The study was a treatment by levels design using the analysis of variance statistic.

Results

The accompanying tables report results of the analysis of variance obtained from the mean scores on the Stanford Achievement Battery. The four levels of motor develop-

Source of Variance	Sum of Squares	df	Mean Square	F
Blocks	1300.12	3	433.37	4.31 **
Groups	159.01	1	159.01	1.59
Occurrences	105.12	1	105.12	1.04
B X G	724.78	3	241.59	2.40
B X O	76.72	3	25.58	.25
G X O	62.35	1	62.35	.62
B X G X O	863.85	3	287.95	2.86 *
Error	5628.1	56	100.5	—
TOTAL	8920.05	71		

* $p < .05$ ** $p < .01$

Table 4. Analysis of Variance of Word Study Skills Scores on Stanford Achievement Test

ment as determined by scores on the Lincoln-Oseretsky Scale are designated by the term "blocks." The experimental and control groups are termed "groups." The pretests and post-tests are called "occasions."

The significant F in blocks shown on the Word Study Skills Test in Table 4 reflects the difference between the gain scores made by

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Source of Variance	Sum of Squares	df	Mean Square	F
Blocks	1009.98	3	376.66	2.46
Groups	256.89	1	256.89	1.67
Occurrences	60.50	1	60.50	.39
B X G	2879.96	3	959.99	6.25 **
B X O	208.47	3	69.49	.45
G X O	.89	1	.89	.006
B X G X O	3089.3	3	1029.76	6.76 **
Error	8555.97	56	153.88	—
TOTAL	16061.9	71		

** p < .01

Table 5. Analysis of Variance of Language Scores on Stanford Achievement Test

the high motor dexterity subjects, and the gain scores made by the low motor dexterity subjects. It seems logical to expect that significance would appear on every test in this area. Indeed, each summary table shows a large F for blocks with the exception of the Spelling Test, Table 3. This supports the inference that high motor dexterity subjects will show higher gains than low motor dexterity subjects because for them typewriting is a more functional tool for work production in the language arts.

The significance shown in Table 4 in the interaction of blocks by groups by occasions is noteworthy. Word Study Skills appear to be influenced by typing in the classroom. Table 5 supports the same inference and emphasizes it with a significance at the interaction between blocks and groups. This is very interesting. Upon close scrutiny of the scores in the Language Test, it is apparent that high motor dexterity subjects

scored higher gains than the low motor dexterity subjects.

Conclusions

The results of the study suggest that the design of the study must be sound to produce significance at a higher level than chance in some places. In general, the study seems to support the findings of Wood and Freeman (1932) which concluded: "In grades three to six the partial correlation studies indicated that the total Stanford Achievement Test gains were positive but small." The present study added a new factor when the matching of pairs for the comparisons was done on the basis of motor dexterity instead of chronological age and mental age. Discovering the similarity of results strengthens the evidence already recorded that high motor dexterity and high mental age are positively correlated to a significant degree.

In view of the brief time lapse of the occasions, the results show the beginnings of what could be important influences on the learning behaviors of pupils in the lower grades of the elementary school. There is need to repeat the study using a longer time between the pretest and the post-test. It seems worthy to take a look at the influences that typewriting could have on the learning process in the classrooms of the elementary school.

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