

A SURVEY TO DETERMINE THE OPINIONS  
OF NASHVILLE-METROPOLITAN TEACHERS  
REGARDING VARIOUS OFFICE MACHINES  
AND A WORKSHOP IN LEARNING HOW TO USE THEM

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A RESEARCH PAPER

Presented to

Austin Peay State University

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In Partial Fulfillment  
of the Requirements for the Degree  
Master of Arts in Education

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by

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To the Graduate Council:

I am submitting herewith a Research Paper written by Charles Wilson Cocke entitled "A Survey to Determine the Opinions of Nashville-Metropolitan Teachers Regarding Various Office Machines and a Workshop in Learning How to Use Them." I recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Arts, with a major in business.

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Dean of the Graduate School

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## I. INTRODUCTION

### Statement of the Problem

Teachers at Donelson High School have asked to be shown how to operate office machines, such as the ink duplicator and the adding machine. If one faculty feels the need for office machine instruction, likely teachers in other schools feel the same need. Any number of machines--various types of spirit and ink duplicators, adding machines, calculators, copying machines--may be available in schools but are not fully utilized because few, if any, teachers know how to use them. Teachers who want to know more about office machines may not have anyone to ask, or they may not know whom to ask. This problem leads to the hypothesis that there may be an existing need and a desire on behalf of the teachers in the Metro-Nashville School System for a workshop for instruction in the use of office machines. The research for this study has attempted to validate that hypothesis.

Also, an attempt was made to find which office machines Metro teachers are now using, and which office machines they would like to be able to use.

Furthermore, an effort was made to find out how Metro teachers are making their test copies available to their students--if they were making use of any type of office machine in doing so.

### Importance of the Study

If Metro teachers were able to use various office machines efficiently, they may:

1. Decrease the maintenance cost of machines
2. Decrease the amount of wasted paper
3. Decrease the amount of time spent in preparing materials
4. Increase variety in using machines
5. Increase effective communications

Also, if teachers knew how to use business machines efficiently, they might be able to use them for the following purposes:

1. Duplicate instructional materials
2. Duplicate study guides
3. Duplicate letters and memoranda
4. Prepare master units and stencils
5. Prepare professional growth materials
6. Total and average student grades
7. Total and average student attendance reports

### Background of Study

In the past, the Nashville school administration has not offered system-wide instruction in the use of office machines. In fact, the teacher in-service training programs have not been geared to offering such special training to all its teachers regardless of instructional area. In-service instruction dealing with on-the-job problems is organized strictly on a departmental basis. These programs in the

past have dealt with problems of classroom instruction in the subject areas. Teachers in the various instructional areas have the opportunity to suggest training programs they feel a need for by filling out questionnaires from their supervisors. If, then, teachers of Metro have desired training in the use of machines, they would have had to request a special program in their individual instructional areas. Apparently, in the past this need has not been considered one to be met by subject-area in-service programs.

Aside from the in-service training programs, the Nashville schools depend on the instructional opportunities offered by the various colleges and universities in the area. The Metro system has not been able, however, to depend on these institutions to instruct its teachers in the use of office machines. Besides the fact that teachers have to bear the financial burden of college instruction, the courses offered are not necessarily designed to meet the teachers' needs. The courses are usually designed for the business teacher. For example, Peabody College for Teachers offered a course in instruction in the use of office machines in 1965, but this course was practical only for the business teacher who trains future office workers in the use of office machines or for those desiring preparation for office work. All teachers would not have had the need to learn the use of all the machines used in that course. For example, an English teacher would not have felt the need to learn the use of various bookkeeping and posting machines as would a business teacher.

No course or workshop to meet the needs of all teachers with regard to machines they might use has been offered by any of the institutions in the area because of course design. The courses were designed according to requests made by the supervisor of business teachers for Metro to include those machines beneficial to business teachers only. No attempt was made to offer machine instruction to meet the needs of English teachers, history teachers, math teachers, and others. ✓

The writer, in an attempt to find a study similar to the study made, investigated references available at George Peabody College and Austin Peay State University. After investigating the card catalog in the library of the two schools under such headings as: workshops, machines, office machines, business machines, teachers, teaching, professional, training, and in-service, the writer investigated the business education index covering the past decade and could not find information relative to the study made.

Aside from investigating reference materials, the writer telephoned Mr. Charles Nix, Supervisor of Business Education for Metro Schools, and inquired if he was aware of any workshop in the instruction of the use of office machines which had been offered to all Metro teachers. Mr. Nix said he was not cognizant of any such workshop having been offered.

## Effectiveness of Workshops

According to research done by Wayne State University, workshops have proved effective in teaching. The workshop method of teaching was used by Wayne State in a one-semester evening class. For thirteen years this one-semester course was taught by the workshop method.

Earl C. Kelly, commenting on the effectiveness of workshops, wrote:

Man has been searching for a more effective method of putting into practice the truths that have become known about how people learn. It is vital that a way be found to establish an environment which enables children and adults to learn. This environment must bring about recognition of individual worth; and it must help us to learn how to live among our fellow men with more understanding. A way must be found to enable groups of people to learn from each other and help each other toward the solution of common problems. We who have experienced the method of the Education Workshop are convinced that through it and other similar experiences these goals can be accomplished. We have found that the workshop creates changes in the individual that make him not only a better person and a more effective teacher, but a person whose relations with his students will be more wholesome and productive.<sup>1</sup>

## Characteristics of Workshops

Since the Metropolitan-Nashville Board of Education has no written policies regarding the use of workshops as a means of working with teachers, the workshop characteristics, suggested by Burton and Brueckner<sup>2</sup> might be followed:

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<sup>1</sup>Earl C. Kelley, The Workshop Way of Learning (New York: Harper & Brothers, 1951), p. ix.

<sup>2</sup>William H. Burton and Leo J. Brueckner, Supervision A Social Process, Third edition, (New York: Appleton-Century-Crofts, Inc., 1955), pp. 148-150.

1. The length of the session must be adequate.
2. The collection of resource materials of all kinds likely to be of value to participants should be as extensive as finances permit.
3. The staff should represent a wide diversity of personnel.
4. The full-time staff may be based on the ratio of one staff member for each 12-15 participants.
5. The physical facilities should permit varied experiences.
6. The over-all purpose must be clearly defined.
7. The specific problems of the participants must emerge and be defined without pressure or steering from above.
8. Tentative and flexible groupings may be made around common problems.
9. The process of the workshop is cooperative and participatory throughout.
10. The personal and social growth of the individual participants should be provided for as well as their growth in the solution of professional problems.
11. The physical facilities should be adequate.

### Purpose of Study

The purpose of this study is to find answers to the following questions:

1. How many teachers, if any, in the Metro School System are interested in taking a workshop in order to learn how to use various office machines?
2. Which office machines are used more often than others by Metro teachers?
3. Which office machines would Metro teachers like to be able to use? Have used? Familiar with but cannot use? Would use if available?

4. How are Metro teachers making test copies available to their students--are they using office machines?

### Limitations of Study

This research project was carried out within certain limitations. The number of subjects was limited to 160 of the 4,000 teachers in the Metropolitan-Nashville School System selected by the random sampling research technique. Administrators and non-teaching personnel were not included in the study. The writer chose to confine the questioning of teachers to their use of only six office machines which he considered to be those most often found in Metro schools. The writer considered these machines to be in Metro schools after having visited several of the schools during his four years of teaching in the Metro School System. The conclusions drawn are not accompanied by recommendations.

### Definition of Terms

Office Machines - Machines used in performing various clerical tasks such as: preparing original copies of written materials; duplicating copies of written materials; and adding, subtracting, dividing, and multiplying figures.

Classroom Teachers - Teachers of senior high, junior high, and elementary grade levels listed in the Directory of Personnel for Metropolitan Schools.<sup>3</sup>

Random Sample - The sampling technique which gives every member of the universe an equal chance of being included.

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<sup>3</sup> \_\_\_\_\_, Directory Metropolitan Public Schools, 1967-68, (Nashville: Metropolitan Board of Education,) 1967.

School Delivery - A method of delivering school-related mail by using personnel employed by the board of education.

Workshop - A shop in which work is accomplished with emphasis upon the production of end results useful to the participants and desired by them.<sup>4</sup>

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<sup>4</sup>Op. Cit., Burton and Brueckner, p. 147.

## II. METHODS AND PROCEDURES

### Preparation of Questionnaire

In the preparation of the questionnaire to be used in this study, certain precautions were taken by the writer to insure response. The questionnaire was designed attractively on one page, and the questions were stated in such a manner that they could be answered by placing a checkmark on an available line. All questions were limited to facts except for three questions asking for opinions. There was no effort made to secure the names of people who made responses to the questions. Also, the questionnaire was designed to contain questions which appeared to be of value to those who participated in answering them.

A letter and self-addressed envelope were mailed along with the questionnaire to solicit response and to inculcate an interest on the part of those participating in the study. (See Appendix)

After the questionnaire including questions relative to the purpose of the study was approved by the instructor, it was prepared on a master unit and duplicated to be used as a sample. Ten sample copies were duplicated by spirit duplicator. Of these ten, four samples were given to senior high teachers and three to junior high teachers at Donelson High School, and three were given to elementary teachers at McGavock Elementary School. This procedure with the sample copies was necessary in order to discover any difficulties that might be incurred in answering the items on the questionnaire.

After the ten sample questionnaires were returned and tabulated, a conference was held with the college advisor of the investigator to see if any questions or items needed to be revised. The conference revealed that one of the items needed to be revised for clarity. The item "familiar with" relative to office machines did not allow the writer to know if the person responding was familiar with machines to the extent they could use them or could not use them. Therefore, the item was revised to "familiar with but cannot use." The final questionnaire (see Appendix of this study for copy) was then prepared on a stencil for distribution to a random sample of teachers throughout the Metro School System.

#### Determination of Sample Size

The Metropolitan-Nashville School System has 4,000 teachers. In order to collect facts and opinions of a proportion of all teachers which may represent the facts and opinions of almost all Metro teachers, a formula<sup>5</sup> for selecting a random sample was used by the writer. The writer contacted several text materials and finally decided on a ✓ formula for determining sample size.

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<sup>5</sup>Cecil H. Meyers, Elementary Business and Economic Statistics, Belmont, California: Wadsworth Publishing Company, Inc., 1966, p. 212.

The formula, explanation of the formula, and its solution are as follows:

n represents the number to be selected for random sampling  
 V represents the coefficient of standard deviation  
 z represents the confidence coefficient  
 N represents the universe to be sampled  
 E represents the allowable error

The confidence coefficient, or the population which would be represented each time a sample of this size was taken, is 99 percent. According to a "z" transformation table of normal curve values, a .99 confidence coefficient expressed in decimal terms is 2.58. "V" or the coefficient of standard deviation is 10 percent. The universe to be sampled or "N" is 4,000, and "E" the allowable error used in making projections is 2 percent.

The solution of the formula is:

$$n = \frac{z^2 NV^2}{NE^2 + z^2 V^2}$$

$$n = \frac{(2.58)^2 (4,000) (.1)^2}{(4,000) (.02)^2 + (2.58)^2 (.1)^2}$$

$$n = \frac{(6.6564) (4,000) (.01)}{(4,000) (.0004) + (6.6564) (.01)}$$

$$n = \frac{266.256}{1.666564}$$

$$n = 159.76 \text{ or } 160$$

A questionnaire was mailed to 160 Metro teachers as *why not 160*  
 determined by using the above formula for determining sample size.

The .02 error allowance used in the formula represents 80 of the 4,000 Metro teachers. For example, in making projections, if the survey should indicate 1,000 teachers were interested in a workshop, it may be projected that a minimum of 920 or a maximum of 1,080 would be interested in a workshop. In other words, any projection made using the number 4,000 (the number of Metro teachers) a plus or minus 80 would have to be allowed.

### Selection of Persons to Receive Questionnaire

In order to select the 160 teachers out of Metro's 4,000 to receive a questionnaire, a table of random sample numbers was used. The advantages of using random sampling numbers, clearly stated by M. G. Kendall<sup>6</sup> in his book, Tracts for Computers, are:

It was recognized by some workers early in the development of statistics that many of the methods which may reasonably be expected to yield random samples are, in fact, biased. The evidence which has since accumulated supports that view. It seems that wherever any human element of choice is allowed free play, as, for instance, when an observer selects "at random" by eye a number of plants in a field, or draws cards "haphazardly" from a pack, bias inevitably creeps in. There may be individuals whose psychological processes are so finely balanced that they can deliberately choose random samples; but they are the exception not the rule, and the ordinary statistician dare not use his own nervous mechanism as a random selector.

There is thus a need for an objective method of drawing random samples, which form the basis of a large section of theoretical and practical statistical studies. In the search for a reliable method many devices have been tried, but those which offer the greatest a priori prospect of randomness are

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<sup>6</sup>M. G. Kendall and B. Bobington Smith, "Tables of Random Numbers," Tracts for Computers, No. XXIV London: Cambridge University Press, 1939, p. 5-15.

unfortunately difficult to wield in practice--the method of Random Numbers is the most reliable and often the speediest method of drawing random samples--other methods may be quicker and just as adequate for particular problems--but no other method is known which can in practice be used without misgiving on any problem.

In order to use random sample numbers, each person in the universe (4,000) must be assigned a number. Each person must be assigned as many digits as there are in the total population. Therefore, as there are 4,000 teachers in the population, the first teacher listed in the Metropolitan Directory of School Personnel was assigned a four-digit number (0001).

For the purpose of selecting the random sample number of each teacher to receive a questionnaire, the author used Kendall's list of numbers in random order. Kendall's list contains 10,000 six-digit numbers in random order, but since the population for this study was 4,000, only the first four digits of Kendall's numbers were used. In order to select the first number and allow that number to be random, a pencil, point first, was dropped on one of the pages opened to the random numbers. The number which the pencil point struck was used as the first random number, and all other numbers were then chosen by beginning with the first number in the columns containing the 10,000 random numbers. If a number larger than four thousand appeared in the columns, that number was omitted and the next four-digit number was chosen until a total of 160 four-digit numbers had been chosen.

A double check was made by counting to see if 160 numbers had been selected. Each number assigned in the personnel directory corresponding with a number selected from the random sample numbers was circled. These circled numbers were counted to see if they totaled 160.

#### Distribution of Questionnaire

Approval was given by Dr. Virginia Dobbs, Director of Pupil Personnel for Metro Schools, to mail the questionnaires and have them returned through the school delivery system. Envelopes containing a questionnaire and a letter of transmittal were addressed to the 160 teachers whose names corresponded with the random numbers selected and circled in the directory and were mailed to their schools. All 160 questionnaires were returned within three weeks to Donelson High School.

#### Tabulation of Questionnaires Returned

As the questionnaires were returned, the results were tabulated manually by the investigator using the cross-five method (~~111~~). After all the questionnaires were returned, a re-check was made to verify the totals made by the first count. Again, the cross-five method was used. The totals for each item to be checked on the questionnaire were placed on a blank questionnaire, which is included in the Appendix of this study.

### III. FINDINGS OF THE STUDY

#### Summary of Findings

The 160 teachers included in the survey were asked if they would be interested in taking a workshop in learning to use various office machines. Eighty four said "yes," and 76 said "no." Therefore, based on an error allowance of .02 it may be projected that from 2,020 to 2,180 of Metro's 4,000 teachers should be interested in taking a workshop.

The 160 teachers were also asked if they thought such a workshop would be helpful to them. Ninety four said "yes," and 66 said "no." Again, a projection may be made that a minimum of 2,350 of Metro's 4,000 teachers should say a workshop would be helpful to them.

The questionnaires returned revealed that 138 of the 160 teachers involved in the study said that an office machines workshop should be counted towards professional growth credit. A projection based on such answers would indicate that 3,422 teachers believe a workshop in the use of office machines should be counted towards professional growth.

#### How Teachers Responded to Questions Regarding Office Machines

Six office machines were listed on the questionnaire included in this study. The office machines and questions relative to them are listed in Table II on page 17 of this study. Also, Table II shows the number out of 160 teachers

who made responses to the six machines, the percentage of the 160 answering, and a projected total based on the 4,000 teachers in Metro. An error allowance of .02 is included in making the projected totals, therefore, a plus or minus 80 should be considered when finding minimum and maximum totals.

How Teachers Make Test Copies Available to Students

The teachers included in this study were asked how they made test copies available to their students. The responses made and the percentage of responses made by the 160 teachers are listed below in Table I.

TABLE I		
HOW 160 TEACHERS MAKE TEST COPIES AVAILABLE TO STUDENTS		
Method	Number	Percent
Overhead Projector	16	9.3
Printed	28	17.5
Chalkboard	68	41.25
Duplicator	137	85.6

SUMMARY AND PROJECTION OF  
 RESPONSES MADE BY 160 TEACHERS  
 ANSWERING QUESTIONS ON THE QUESTIONNAIRE  
 MAILED TO METRO-NASHVILLE TEACHERS  
 APRIL, 1968

QUESTIONNAIRE SUBJECT	Number	%	Projection of Total Number + or - 80
<b>I. <u>Typewriter</u></b>			
Now Use			
Have Used	97	60.6	2,424
One Most Often Used	53	33.1	1,324
Familiar With But Cannot Use	53	33.1	1,324
Would Use If Available	18	11.3	452
Would Like To Be Able To Use	9	5.6	224
	17	10.6	424
<b>II. <u>Adding Machine</u></b>			
Now Use			
Have Used	57	35.6	1,424
One Most Often Used	78	48.7	1,948
Familiar With But Cannot Use	7	4.3	172
Would Use If Available	11	6.8	272
Would Like To Be Able To Use	13	8.1	324
	7	4.3	172
<b>III. <u>Spirit Duplicator</u></b>			
Now Use			
Have Used	127	79.3	3,172
One Most Often Used	54	33.7	1,348
Familiar With But Cannot Use	82	51.2	2,048
Would Use If Available	13	8.1	324
Would Like To Be Able To Use	7	4.3	172
	7	4.3	172
<b>IV. <u>Ink Duplicator</u></b>			
Now Use			
Have Used	50	31.2	1,248
One Most Often Used	55	34.3	1,372
Familiar With But Cannot Use	13	8.1	324
Would Use If Available	13	8.1	324
Would Like To Be Able To Use	9	5.6	224
	18	11.2	448
<b>V. <u>Calculator</u></b>			
Now Use			
Have Used	7	4.3	172
One Most Often Used	25	15.6	624
Familiar With But Cannot Use	--	----	----
Would Use If Available	34	21.2	848
Would Like To Be Able To Use	16	10	400
	33	20.6	824
<b>VI. <u>Copying Machine</u></b>			
Now Use			
Have Used	23	14.3	572
One Most Often Used	37	23.1	924
Familiar With But Cannot Use	--	----	----
Would Use If Available	34	21.2	848
Would Like To Be Able To Use	33	20.6	824
	33	20.6	824

#### IV. CONCLUSIONS

This study has revealed a projected total of at least 2,020 of the 4,000 Metro teachers are interested in a workshop in learning to use various office machines if such a workshop were to be offered. This figure was determined by projection of the responses received from the sample taken in which 52.5 percent of the 160 persons questioned replied "yes" to the question: "If such a workshop should be offered, would you be interested in taking it?" With this in mind, the conclusion is reached that a desire and a need on the part of Metro teachers to participate in such a workshop exists.

Also, Metro teachers think a workshop in learning to use various office machines efficiently would be helpful to them. This conclusion is based on the fact that out of the 160 teachers who were asked if they thought learning to use office machines efficiently would be helpful to them, 58.75 percent answered "yes."

When asked whether they thought professional growth credit should be given for such a workshop, 86.25 percent of the teachers questioned said "yes." The writer concludes that a workshop granting professional growth credit to its participants creates more incentive than a workshop which does not grant professional growth credit.

Of the 160 teachers who participated in this study, 20.6 percent said they would like to be able to use the

copying machine and the calculator. Also, 11.2 percent of the teachers said they would like to be able to use the ink duplicator and 10.6 said they would like to be able to use the typewriter. However, only 4.3 percent of the 160 teachers said they would like to be able to use the spirit duplicator and the adding machine. With this in mind, the writer concludes that Metro teachers would like to learn how to use the copying machine, calculator, ink duplicator, and typewriter more than they would like to learn how to use the spirit duplicator and the adding machine if a workshop in learning to use office machines were to be made available to them.

The efficient use of the typewriter and spirit duplicator is beneficial to effective teaching. However, the ability to use the other machines listed on the questionnaire is also important. The results of the survey show that the adding machine, ink duplicator, calculator, and copying machine are not used as often by the teachers in the Metro-Nashville School System. Why? The writer concludes two reasons are responsible for the lack of use of these machines. They are: such machines may not be available for use and teachers are not properly trained to use the machines when they are available. The lack of competency in using these machines would be decreased if a workshop were available.

This study also revealed that Metro teachers are using the duplicator, overhead projector, chalkboard, and printed tests to make test copies available to students. But they are using the duplicator most often. Regarding the reproducing of tests, Mathilde Hardaway,<sup>7</sup> in her book, Test and Measurements in Business Education, writes:

Tests may be reproduced by Mimeograph, Ditto, Multigraph, Hectograph, or Photo-Offset. The first two of these procedures are by far the most common.

The writer concludes that Metro teachers are using one of the most common means of reproducing test copies, while at the same time they are making use of office machines. Also, the little desire to learn how to use the spirit duplicator was due to the fact they may already know how to use it as indicated by the 79.3 percent of the teachers participating in the study who said they were using the spirit duplicator.

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<sup>7</sup> Mathilde Hardaway and Thomas B. Maier, Test and Measurements in Business Education, Second edition, Cincinnati: South-Western Publishing Co., 1952, p. 233.

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## APPENDIX

Donelson High School  
Nashville, Tennessee  
April 30, 1968

Fellow Teacher,

Will you please help me by answering and returning the enclosed questionnaire.

You can complete it within 7 minutes and by doing so, you will not only be helping me complete requirements in a graduate course, but may help other teachers as well.

You were selected to receive my questionnaire as a result of random sampling of all metro teachers. Please drop it in the school delivery mail today after you have completed it. I need to have a reply from every person selected. If I can ever be of help to you, please let me know.

Respectfully yours,

*Charles Coker*

Charles Coker  
Business Teacher

Enclosure 1 questionnaire  
1 self-addressed envelope

LETTER OF TRANSMITTAL

## USING OFFICE MACHINES

1. Which grade level do you teach? \_\_\_\_\_
2. Please place a check mark below in each column which applies to you.

	Typewriter	Adding Machine (Any Type)	Spirit Duplicator (Ditto)	Ink Duplicator (Stencils)	Calculator	Copying Machine	Other	Other	Other
Now use	97	57	127	50	7	23			
Have used	53	78	54	55	25	37			
One most often used	53	7	82	13	0	0			
Familiar with but cannot use	18	11	13	13	34	34			
Would use if available	9	13	7	9	16	33			
Would like to be able to use	17	7	7	18	33	33			

3. How do you make test copies available to students?  
 chalkboard 68 duplicator 137 overhead projector 15 printed 28
4. Do you think a workshop in learning how to use the above mentioned machines efficiently would be helpful to you?  
 yes 94  
 no 66
5. Do you think such a workshop in the use of machines should be counted towards professional growth credit?  
 yes 138  
 no 22
6. If such a workshop should be offered, would you be interested in taking it?  
 yes 84  
 no 76

TOTALS OF ANSWERS TO QUESTIONS ON QUESTIONNAIRE