Relevancy of Equipment Maintenance to the Everyday Activities of Secondary Industrial Arts Teachers in Virginia Beach Public Schools

Jeffrey Mark Forman
Old Dominion University

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RELEVENCY OF EQUIPMENT MAINTENANCE TO THE EVERYDAY ACTIVITIES
OF SECONDARY INDUSTRIAL ARTS TEACHERS
IN VIRGINIA BEACH PUBLIC SCHOOLS

A Research Paper
Presented to
The Faculty of the School of Education
Old Dominion University

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

by
Jeffrey Mark Forman
August 1978
This research paper was prepared by Jeffrey Mark Forman under the direction of his advisor and instructor in Problems in Education ECIMI 536. It is submitted to the Graduate Program Director for Secondary Education in partial fulfillment of the requirements for the Degree of Master of Science in Education.

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Chapter 1
INTRODUCTION

The maintenance of tools and machines in a secondary school industrial arts program is a major concern and responsibility of every industrial arts teacher. In order for a teacher to carry-out the activities of the program, the equipment must be in safe operating condition. Working without properly maintained equipment the task of teaching becomes difficult and sometimes unsafe. The teacher can not expect his students to be successful using tools and machines that are not properly maintained.

RESEARCH QUESTIONS

This study sought to identify the amount of time and effort spent on equipment maintenance by industrial arts teachers in the Virginia Beach City Public School system. Questions important to the study are:

1. What part of the school day do teachers use to maintain equipment?

2. Does proper equipment maintenance take away from the teacher's instructional duties?
3. Do industrial arts teachers have the competency needed to properly maintain most equipment?

4. Is extra time spent maintaining equipment?

5. Do students help perform equipment maintenance?

6. Are teachers satisfied by the maintenance of equipment performed by the school system or an outside agency?

7. Do teachers believe that maintaining equipment is an important part of their job responsibilities?

8. Are records kept on the maintenance performed on equipment?

ASSUMPTIONS

This study was based on the following assumptions:

1. Equipment maintenance is an important facet of the everyday activities of teachers in industrial arts.

2. A considerable amount of time and energy is spent maintaining equipment.

3. Equipment maintenance is one of the responsibilities of industrial arts teachers.
LIMITATIONS OF STUDY

The following limitations were applied to this study:

1. This study was limited to those secondary school industrial arts teachers employed as of May 13, 1978 in the Virginia Beach City Public School system.

2. This study also focused on those equipment maintenance activities necessary to keep tools and machines in proper and safe operating condition.

DEFINITIONS OF TERMS

The following terms were used and found essential for the understanding of this study:

1. equipment - tools and machines used in the industrial arts laboratory.

2. equipment maintenance - work necessary to keep tools and machines in proper and safe operating condition (usually limited to servicing, minor adjustments, and limited tool sharpening).

3. industrial arts teacher - a person who teaches industrial arts a minimum of 4 class periods each school day.

4. secondary school - classes in the 7 to 12 grade level.

5. laboratory - the industrial arts facilities.
6. **maintenance performed by school system or outside agency** - work done by school maintenance personnel or private company.

7. **industrial arts** - elective course in a general education program that teaches the understanding of technology.

8. **competency** - ability to perform a job or task relevant to the overall job performance.
Chapter 2
REVIEW OF RELATED LITERATURE

Literature relating to the relevancy of equipment maintenance to the responsibilities of secondary industrial arts teachers is well defined by various sources. Review of the literature focused on the necessity of industrial arts teachers to maintain equipment in safe operating condition and the reasons why it should be done.

According to G. Harold Silvius and Estell H. Curry (1971, p. 208, 209) there are three reasons for keeping tools and equipment in first class condition. The three reasons are listed and discussed as follows:

1. To promote a high degree of efficiency.
2. To maintain safe working conditions.
3. To keep cost of operation low and prolong life of equipment.

A student can become easily discouraged if the condition of the equipment does not enable him/her to utilize it the way he/she was instructed. This situation could lead to students deliberately abusing the equipment. Thus, the efficiency of the laboratory can affect the student's attitudes towards the industrial arts class and other programs that the student might undertake in the future.
The industrial arts teacher makes every effort to teach safety and safe work practices. Unless the equipment is maintained in safe operating condition, safety instructions and practices taught to the students will be little or no value at all.

Budget and cost considerations are the third purpose for maintaining equipment. If the equipment in the laboratory now is not maintained, chances are when new equipment is requested the request will be denied. Condition of the existing equipment and low maintenance costs are keys to administrators that decide whether replacement equipment or additional equipment is purchased upon the request of the industrial arts teacher.

Lindbeck (1972, p.166) believes that industrial arts teachers should assume that their maintenance activities are restricted to servicing, minor adjustments, and limited tool sharpening. As the reviews of literature on the topic addresses itself, these maintenance activities are essential knowledge to all industrial arts teachers. But Mays and Casberg (1954, p.66) feel that successful maintenance is dependent upon the intelligence, energy, and efficiency of the individual teachers.
SUMMARY

This chapter on review of related literature based its findings on the fact that equipment must be maintained by the industrial arts teacher as one of the fundamental tasks of the job of teaching.
Chapter three of this study deals with the methods needed for carrying-out the research study. These methods are listed below:

2. Instrument development.
3. Data collection.
4. Data Analysis.

POPULATION

The population in this study consisted of those secondary school industrial arts teachers employed as of May 13, 1978 in the Virginia Beach City Public School system. A listing of the teachers participating in this study was acquired from Mr. Armond Taylor, Virginia Beach Industrial Arts Supervisor and Curriculum Specialist.

INSTRUMENT DEVELOPMENT

A number of statements were composed by the researcher concerning equipment maintenance activities of industrial arts teachers. Composition of these questions were based upon the
review of literature, the researcher's personal experiences, and informal interviews with present and former junior and senior high school industrial arts teachers.

The questionnaire was divided into two sections. The first section contained important terms and their definitions which were essential for understanding the questions and responses. Teaching experience, education level, teaching level, and courses(training) in equipment maintenance were used to find some background information on the teachers for categorizing the responses. This part was important to determine any major difference between the level of teaching and the questions in part two of the survey.

Section two of the questionnaire contained the questions directly relating to the research study. Responses to the questions were stated for ease and speed of marking by the respondents.

In developing the questionnaire, the researcher attempted to keep the questions and responses as precise and direct as possible.
DATA COLLECTION

Questionnaires were sent through the interschool mailing system to all Virginia Beach City junior and senior high school industrial arts department chairmen for members of their respective departments. This method was utilized by the reasearcher to facilitate a lower number of followups to non-respondents. Three days after the set deadline for return fo the questionnaires, followup phone calls and messages were initiated to speed return of those schools not responding to the questionnaire deadline.

DATA ANALYSIS

A talley was made for each individual question and their responses. All totals were tabulated for the questions and percentages were deemed necessary to analyze the results of the questionnaire. Results of the questionnaire statements were compared as follows:

1. The teaching level of the respondents were compared to the responses to indicate any significant difference between junior and senior high school responses.

2. The results of the questionnaire statements were studied and compared to the information found in the related
literature, and assumptions found in this study.

The results of the questionnaire findings are contained in tables 1 through 15 in chapter 4.

SUMMARY

This chapter focused on the techniques utilized for setting up, administering, and reporting the responses from the questionnaires.
Chapter 4

Results

Of the 62 surveys distributed to the secondary school industrial arts teachers in the Virginia Beach City Public Schools, a total of 54 responded to the questionnaire statements. This represents a 87 percent return rate which is judged fairly valid according to statistical measurements. (It should be noted that numbers in the following tables ending in tenths were rounded off to the nearest whole number.)

Table 1

Responses/Teaching Level

<table>
<thead>
<tr>
<th></th>
<th>Junior High</th>
<th>Senior High</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. Sent</td>
<td>27</td>
<td>35</td>
<td>62</td>
</tr>
<tr>
<td>No. Responding</td>
<td>26 (95%)</td>
<td>28 (80%)</td>
<td>54</td>
</tr>
<tr>
<td>% of Responses</td>
<td>48%</td>
<td>52%</td>
<td>87%</td>
</tr>
</tbody>
</table>

As the above table indicates there is no significant difference between the total number of junior and senior high school teachers responding to the questionnaire.
<table>
<thead>
<tr>
<th>Level</th>
<th>Yes/%</th>
<th>No/%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate</td>
<td>33(61%)</td>
<td>21(39%)</td>
</tr>
<tr>
<td>Graduate</td>
<td>1(2%)</td>
<td>53(98%)</td>
</tr>
<tr>
<td>In-Service</td>
<td>15(28%)</td>
<td>39(72%)</td>
</tr>
<tr>
<td>Other*</td>
<td>7(13%)</td>
<td>47(87%)</td>
</tr>
</tbody>
</table>

As shown above, the majority of respondents (61\%) have had some experience as undergraduates in college courses covering equipment maintenance activities. Very few of the respondents have had training for graduate credit or in-service activities in equipment maintenance.

*Of those teachers with other experiences with equipment maintenance activities, four teachers answered on-the-job work experience, two teachers denoted naval training activities and experiences, and one teacher had experience in the manufacturing department of a major company.
Table 3
Responses/Junior High-Senior High Questionnaire Statement 1

Question: *What part of the school day do you use to maintain equipment?

<table>
<thead>
<tr>
<th></th>
<th>Junior High</th>
<th>Senior High</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. / %</td>
<td>No. / %</td>
<td>No. / %</td>
</tr>
<tr>
<td>Before School</td>
<td>11(17%)</td>
<td>7(13%)</td>
<td>18(15%)</td>
</tr>
<tr>
<td>During School</td>
<td>19(30%)</td>
<td>11(20%)</td>
<td>30(25%)</td>
</tr>
<tr>
<td>Planning Bell</td>
<td>18(29%)</td>
<td>16(29%)</td>
<td>34(29%)</td>
</tr>
<tr>
<td>After School</td>
<td>15(24%)</td>
<td>21(38%)</td>
<td>36(31%)</td>
</tr>
</tbody>
</table>

*Most teachers responded to one or more of these responses indicating that no one specific period of the school day is spent maintaining equipment.

A majority of the junior high teachers (30%) maintain equipment during school whereas, the majority of the senior high school teachers (38%) use the time after school to maintain equipment. Combined the majority of the junior and senior high school respondents utilize their time after school to properly maintain equipment in their industrial arts laboratories.
Table 4
Responses/Junior High-Senior High Questionnaire Statements 2-5

<table>
<thead>
<tr>
<th>Question</th>
<th>Always</th>
<th>Usually</th>
<th>Sometimes</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>3</td>
<td>3</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>4</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>4</td>
<td>9</td>
<td>7</td>
</tr>
</tbody>
</table>

Table 5
Percentages of Response/Junior High-Senior High Questionnaire Statements 2-5

<table>
<thead>
<tr>
<th>Question</th>
<th>Always</th>
<th>Usually</th>
<th>Sometimes</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>12% -11%</td>
<td>27% -29%</td>
<td>62% -59%</td>
<td>0% - 0%</td>
</tr>
<tr>
<td>3</td>
<td>8% -14%</td>
<td>38% -36%</td>
<td>54% -43%</td>
<td>0% - 7%</td>
</tr>
<tr>
<td>4</td>
<td>0% - 0%</td>
<td>15% -39%</td>
<td>58% -43%</td>
<td>27% -18%</td>
</tr>
<tr>
<td>5</td>
<td>4% -14%</td>
<td>35% -25%</td>
<td>54% -50%</td>
<td>7% -11%</td>
</tr>
</tbody>
</table>

Tables 4 and 5 above show no major significance in the majority of responses between junior and senior high school levels. Although the actual percentages differ for the responses, the majority of both groups agree on the same response. Therefore, these questions and responses will be analyzed in the remainder of this chapter for their significance.
as a combined group of both teaching levels.

Table 6

Responses/Yes-No Questionnaire Statements

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Jr.(%) - Sr.(%)</td>
<td>Jr.(%) - Sr.(%)</td>
</tr>
<tr>
<td>6</td>
<td>12(46%) - 14(50%)</td>
<td>14(54%) - 14(50%)</td>
</tr>
<tr>
<td>7</td>
<td>6(23%) - 9(32%)</td>
<td>20(77%) - 19(68%)</td>
</tr>
<tr>
<td>8</td>
<td>25(96%) - 19(68%)</td>
<td>1(4%) - 9(32%)</td>
</tr>
<tr>
<td>9</td>
<td>26(100%) - 27(96%)</td>
<td>0(0%) - 1(4%)</td>
</tr>
</tbody>
</table>

Here again in the above table the majority of respondents in both teaching levels answered the questionnaire statements with the same response. These questionnaire statements will also be analyzed as a combined group for their implications separately in this chapter.

Table 7

Responses/Questionnaire Statement 2

Question: Does proper equipment maintenance take away time that you would otherwise spend on your instructional duties?

<table>
<thead>
<tr>
<th>Always</th>
<th>Usually</th>
<th>Sometimes</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>No./%</td>
<td>No./%</td>
<td>No./%</td>
<td>No./%</td>
</tr>
<tr>
<td>6(11%)</td>
<td>16(30%)</td>
<td>32(59%)</td>
<td>0(0%)</td>
</tr>
</tbody>
</table>
In table 7 on page 16, a defined majority of the teachers responding to this question (59%) felt that properly maintaining the equipment in their laboratories sometimes took away time that could have been used for better preparation of instructional tasks and duties.

Table 8

Responses/Questionnaire Statement 3

Question: Is extra time spent on maintaining equipment (other than the specified time you are suppose to be in school)?

<table>
<thead>
<tr>
<th></th>
<th>Always</th>
<th>Usually</th>
<th>Sometimes</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. /%</td>
<td>6 (11%)</td>
<td>22 (41%)</td>
<td>24 (44%)</td>
<td>2 (4%)</td>
</tr>
</tbody>
</table>

Question 3 and the responses above indicate that as a group 52 or 96% of the industrial arts teachers responding to this question have spent some extra time maintaining equipment in their laboratories.

Table 8 implies that the majority or 44% of the respondents sometimes spend extra time maintaining equipment while 41% usually spend extra time on equipment maintenance activities.
Table 9
Responses/Questionnaire Statement 4

Question: Are you as an industrial arts teacher satisfied with the maintenance of equipment performed by the school system or an outside agency?

<table>
<thead>
<tr>
<th>Always</th>
<th>Usually</th>
<th>Sometimes</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>No./%</td>
<td>No./%</td>
<td>No./%</td>
<td>No./%</td>
</tr>
<tr>
<td>0(0%)</td>
<td>15(28%)</td>
<td>27(50%)</td>
<td>12(22%)</td>
</tr>
</tbody>
</table>

Question 4 of this survey is concerned with the maintenance of equipment not performed by the teacher but by someone else. Half of the responding teachers (50%) are sometimes satisfied when someone else besides themselves or another industrial arts teacher services the equipment in their laboratory. An almost equal number of teachers are either usually satisfied or never satisfied when the equipment is serviced by the school system or an outside agency.

Table 10
Responses/Questionnaire Statement 5

Question: Do you perform other equipment maintenance activities than what is defined as equipment maintenance in this survey?

<table>
<thead>
<tr>
<th>Always</th>
<th>Usually</th>
<th>Sometimes</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>No./%</td>
<td>No./%</td>
<td>No./%</td>
<td>No./%</td>
</tr>
<tr>
<td>5(9%)</td>
<td>16(30%)</td>
<td>28(52%)</td>
<td>5(9%)</td>
</tr>
</tbody>
</table>
The response to question 5 on the preceding page implies that as a group 91% of the responding teachers have performed at sometime maintenance beyond the basic work necessary to keep tools and machines in proper and safe operating condition. This indicates that the majority of these teachers initiate actions beyond those basic equipment maintenance activities to keep their tools and machines completely operative at all times.

Table 11

Responses/Questionnaire Statement 6

<table>
<thead>
<tr>
<th>Question: Do any of your students help perform equipment maintenance?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No./%</td>
</tr>
<tr>
<td>26(48%)</td>
</tr>
</tbody>
</table>

The number of responses to question 6 is almost the same for both yes and no. A slim majority of the teachers indicated that students do not help perform equipment maintenance activities. Just a 4% difference separate the responses so no definite conclusion can be decided upon this statement.
Table 12

Responses/Questionnaire Statement 7

Question: Are records kept on the maintenance performed on equipment?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>No./%</td>
<td>No./%</td>
</tr>
<tr>
<td>15(28%)</td>
<td>39(72%)</td>
</tr>
</tbody>
</table>

Responses to this question indicate that the vast majority of the responding population (72%) do not keep records on those equipment maintenance activities as defined in chapter 1 of this study. Since these activities are usually nothing too major in complexity and are accomplished by the teacher without the need of parts and replacement materials, precise record keeping is probably not essential. It also requires the teacher's time to keep these records and in most instances are never fully utilized.

Table 13

Responses/Questionnaire Statement 8

Question: Do you have the competency necessary to properly maintain most equipment?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>No./%</td>
<td>No./%</td>
</tr>
<tr>
<td>44(81%)</td>
<td>10(19%)</td>
</tr>
</tbody>
</table>
Table 13 on page 20 denotes the fact as related to table 3 that the large majority or 81% of the responding teachers possess the capabilities to properly maintain equipment as it is defined in chapter 1 of this study.

Table 14

Responses/Questionnaire Statement 9

Question: Equipment maintenance is an important facet of the everyday activities of teachers in industrial arts?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>No./%</td>
<td>No./%</td>
</tr>
<tr>
<td>53(98%)</td>
<td>1(2%)</td>
</tr>
</tbody>
</table>

The results of this statement as shown in the table above strongly associate the importance of equipment maintenance to the everyday activities of teachers in industrial arts. Since 53 out of 54 teachers answered yes to this statement it could be implied that equipment maintenance is a fundamental task to the majority of all secondary school industrial arts teachers no matter what level they teach.
Table 15
Responses/ Additional Comments

<table>
<thead>
<tr>
<th>Did Respond</th>
<th>Did Not Respond</th>
</tr>
</thead>
<tbody>
<tr>
<td>No./%</td>
<td>No./%</td>
</tr>
<tr>
<td>13(24%)</td>
<td>41(76%)</td>
</tr>
</tbody>
</table>

The responses were summarized and grouped as follows:

1. Industrial arts teachers not capable or willing to perform equipment maintenance activities should seek another discipline from which to teach.

2. Lack of proper tools and equipment inhibit some teachers from properly maintaining equipment.

3. An additional supplement should be paid industrial arts teachers for their equipment maintenance activities since this is beyond the requirements of teachers in other subject areas.

SUMMARY

This chapter indicated the number of responses and implications to the questionnaire statements by the use of tables and percentages.
Chapter 5
Summary, Conclusions, Recommendations

SUMMARY

This study sought to identify the amount of time and effort spent on equipment maintenance by secondary school industrial arts teachers in the Virginia Beach City Public School system. Questions important to this study included:

1. What part of the school day do teachers use to maintain equipment?

2. Does proper equipment maintenance take away from the teacher's instructional duties?

3. Do industrial arts teachers have the competency needed to properly maintain most equipment?

4. Is extra time spent maintaining equipment?

5. Is equipment maintenance an important facet of the everyday activities of teachers in industrial arts?

A questionnaire with corresponding responses was composed and sent to the department chairmen for their respective departments through the interschool mail system. Of the 62 questionnaires distributed, 54 responses were returned. Upon return of the questionnaires the responses were tallyied and
tabulated for all statements. Percentages were utilized to analyze the results.

This study was subjected to the following limitations:

1. This study was limited to those secondary school industrial arts teachers employed as of May 13, 1978 in the Virginia Beach City Public School system.

2. This study also focused on those equipment maintenance activities necessary to keep tools and machines in proper and safe operating condition.

CONCLUSIONS

As the result of this study, the following conclusions were reached:

1. No significant difference of response to the questionnaire statements is found between the total number of junior and senior high school teachers responding to each question.

2. No one specific period of the school day is used to maintain equipment.

3. Most secondary school industrial arts teachers in the Virginia Beach City Public Schools have the necessary competencies to maintain equipment in their laboratories.
4. Proper equipment maintenance does sometimes take away from the teacher's instructional duties.

5. The vast majority of industrial arts teachers in the Virginia Beach City Public School system are apt to spend extra time maintaining equipment.

6. Industrial arts teachers do not always limit equipment maintenance activities to those basic operations as defined in chapter 1 of this study.

7. Equipment maintenance is an important facet of the everyday activities of teachers in industrial arts.

It is important to remember that this survey was conducted using a limited population when considering the conclusions of this research effort.

RECOMMENDATIONS

As the result of this study the researcher recommends that the following actions could be taken:

1. Subsequent surveys taken in other school systems and divisions seeking to substantiate the findings of this research effort.

2. Colleges and universities preparing secondary school industrial arts teachers either implement or upgrade existing equipment maintenance course offerings.
3. Industrial arts teachers acknowledged for their efforts for maintaining equipment in their laboratories.

4. An increase in pay in the form of a supplement to secondary school industrial arts teachers for maintaining equipment in their laboratories and schools (as defined in this study).
REFERENCES


APPENDIX A

April 13, 1978

Dr. Phillip E. Meekins
Director of Program Development and Evaluation
Virginia Beach City Public Schools
Virginia Beach, Virginia 23456

Dear Dr. Meekins:

As partial fulfillment of the requirements for the Degree of Master of Science in Secondary Education-General Emphasis with an Industrial Arts Interest, I have prepared a research proposal dealing with the relevancy of equipment maintenance to the everyday activities of industrial arts teachers. This research effort is being conducted as part of my graduate work through Old Dominion University.

I respectfully request permission to conduct a survey with the industrial arts teachers in secondary schools within the Virginia Beach City Public Schools. This survey will consist of questions relating to equipment maintenance activities to be completed by the teachers. The completed survey forms will be returned to me unmarked as to the teacher and no records will be kept that might identify any individual. Results of this survey will be sent to your office when the study is completed.

Yours truly,

[Signature]

Mark Forman
Bayside Junior High School
May 12, 1978

Mr. Jeffrey M. Forman
Bayside Junior High School
965 Newtown Road
Virginia Beach, Virginia 23462

Dear Mr. Forman:

Your application to conduct a research project, "Relevancy of Equipment Maintenance to the Everyday Activities of Secondary Industrial Arts Teachers in Virginia Beach City Public Schools," has been reviewed and is approved for implementation. Participation by department chairmen and other industrial arts teachers will be voluntary.

Please send me a copy of your final report to this office.

Sincerely yours,

[Signature]
Philip E. Meekins, Ed.D.
Director
Program Development and Evaluation

cc: Mr. Armand Taylor
Supervisor of Industrial Arts
Mr. Chairman - Industrial Arts Department

Please distribute the enclosed surveys to the members of your department (including yourself). They will be returned to you when completed (by June 1) and then please place them in the self-addressed "pony" envelope and send it to me. Thank you for your time and effort.

Jeff Forman
May 10, 1978

As a part of my graduate work at Old Dominion University, I am conducting a survey concerning equipment maintenance activities of Industrial Arts teachers in the Virginia Beach City Public Schools. Enclosed is a questionnaire which will provide the needed information for my study.

The questionnaire will take approximately 10 minutes to complete. All responses will be kept confidential, so please do not put your name on the questionnaire when you return it.

Being an industrial arts teacher myself I know how busy things can be at this time of year. Therefore I would be very appreciative if you would take the few minutes necessary to complete this survey. Please return your survey to your department chairman by June 1 and he will then send the completed surveys to me via the "pony". Your time and assistance in this study is greatly appreciated.

Yours truly,

Jeffrey M. Forman
Bayside Junior High School
DEFINITION OF TERMS

EQUIPMENT MAINTENANCE - work necessary to keep tools and machines in proper and safe operating condition (usually limited to servicing, minor adjustments, and limited tool sharpening).

MAINTENANCE PERFORMED BY SCHOOL OR OUTSIDE AGENCY - work done by school maintenance personnel or private company.

COMPETENCY - ability to perform a job or task relevant to the overall job performance.

Please check the appropriate box.

Teaching Experience (in number of years):

- 0-3 Years ( )
- 4-8 Years ( )
- 9-12 Years ( )
- 13-15 Years ( )
- 16-19 Years ( )
- Over 20 Years ( )

Education level:

- BACHELOR'S DEGREE ( )
- B.S. PLUS 15 HOURS ( )
- MASTER'S DEGREE ( )
- M.S. PLUS 0-30 HOURS ( )
- HIGHER ( )

At what level do you teach?

- JUNIOR HIGH SCHOOL ( )
- SENIOR HIGH SCHOOL ( )

Have you ever had any courses (or training) in the area of equipment maintenance?

- Undergraduate Yes ( ) No ( )
- Graduate Yes ( ) No ( )
- In-service Yes ( ) No ( )
- Other (specify): ____________________________

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Please answer each of the following questions by circling the appropriate response.

1. What part of the school day do you use to maintain equipment?
   - Before School
   - During School
   - Planning Bell
   - After School

2. Does proper equipment maintenance take away time that you would otherwise spend on your instructoral duties?
   - Always
   - Usually
   - Sometimes
   - Never

3. Is extra time spent on maintaining equipment (other than the specified time you are suppose to be in school)?
   - Always
   - Usually
   - Sometimes
   - Never

4. Are you as an industrial arts teacher satisfied with the maintenance of equipment performed by the school system or an outside agency?
   - Always
   - Usually
   - Sometimes
   - Never

5. Do you perform other equipment maintenance activities than what is defined as equipment maintenance in this survey?
   - Always
   - Usually
   - Sometimes
   - Never

6. Do any of your students help perform equipment maintenance?
   - Yes
   - No

7. Are records kept on the maintenance performed on equipment?
   - Yes
   - No

8. Do you have the competency necessary to properly maintain most equipment?
   - Yes
   - No

9. Equipment maintenance is an important facet of the everyday activities of teachers in industrial arts.
   - Yes
   - No

Additional comments:

--------------------------------------------------------------------------------
APPENDIX G

Responses/Teaching Experience

<table>
<thead>
<tr>
<th>Interval</th>
<th>Frequency</th>
<th>cf</th>
<th>(x)</th>
<th>fx</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-3 years</td>
<td>7</td>
<td>7</td>
<td>1.5</td>
<td>10.5</td>
</tr>
<tr>
<td>4-8 years</td>
<td>26</td>
<td>33</td>
<td>6</td>
<td>156</td>
</tr>
<tr>
<td>9-12 years</td>
<td>10</td>
<td>43</td>
<td>10.5</td>
<td>105</td>
</tr>
<tr>
<td>13-15 years</td>
<td>5</td>
<td>48</td>
<td>14</td>
<td>70</td>
</tr>
<tr>
<td>16-19 years</td>
<td>4</td>
<td>52</td>
<td>17.5</td>
<td>70</td>
</tr>
<tr>
<td>Over 20 years</td>
<td>2</td>
<td>54</td>
<td>21</td>
<td>42</td>
</tr>
</tbody>
</table>

\[ \sum f = 54 \quad \sum fx = 453.5 \]

\[ \bar{x} = 8.398 \text{ or } 8.4 \] (mean for years of teaching experience)

This information indicates the average (or mean) amount of teaching experience of the industrial arts teachers responding to the questionnaire in the Virginia Beach City Public School system.
APPENDIX H

Responses/Education Level

<table>
<thead>
<tr>
<th>Level</th>
<th>Junior High No./%</th>
<th>Senior High No./%</th>
<th>Total No./%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor's Degree</td>
<td>7</td>
<td>8</td>
<td>15 (28%)</td>
</tr>
<tr>
<td>B.S. Plus 15 Hours</td>
<td>8</td>
<td>11</td>
<td>19 (35%)</td>
</tr>
<tr>
<td>Master's Degree</td>
<td>5</td>
<td>8</td>
<td>13 (24%)</td>
</tr>
<tr>
<td>M.S. Plus 0-30 Hours</td>
<td>6</td>
<td>1</td>
<td>7 (13%)</td>
</tr>
<tr>
<td>Higher</td>
<td>0</td>
<td>0</td>
<td>0 (0%)</td>
</tr>
</tbody>
</table>

The results indicate that a majority of the teachers responding to the questionnaire or 35% are at the Bachelor of Science plus 15 hour degree status.